CAMERA ADAPTOR

CA-55P

BETACAM

OPERATION AND MAINTENANCE MANUAL

1st Edition (Revised 6)

Serial No. 40001 and Higher

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TABLE OF CONTENTS
INHALTSVERZEICHNIS

1. OPERATION

1-1. General ..... 1-1 (E)
1-2. Function of Parts ..... 1-2 (E)
1-3. Attaching the CA-55P to the Camera .... 1-4 (E)
1-4. Connections ..... 1-8 (E)
1-5. Scene File ..... 1-10(E)
1-6. Specifications ..... 1-11(E)

1. BETRIEB

1-1. Überblick ..... 1-1 (G)
1-2. Funktion der Teile ..... 1-2 (G)
1-3. Anbringung des CA-55P an der Kamera .. 1-4 (G)
1-4. Anschluß ..... 1-8 (G)
1-5. Szenen-Datei ..... 1-10(G)
1-6. Technische Daten ..... 1-11(G)

2. INSTALLATION

2-1. Unpacking and Repacking 2-1
2-2. Supplied Accessories 2-2
2-3. Connectors/Cable 2-3
2-3-1. Connector Input/Output Signals 2-3
2-3-2. Connector 2-9
2-3-3. Removal of the CCZ, CCZQ Connectors 2-10
2-3-4. Connection of INCOM/PGM Terminal .. 2-12
2-4. Power Supply 2-12
2-5. Operational Accessories 2-13
2-6. Operating Conditions 2-13
2-7. Set-Up 2-14
2-7-1. Set up with the BVP-50/50P/7/7P Camera 2-14
2-7-2. Using the Supplied Cable Clamp 2-14
2-7-3. Attaching the Supplied Shoulder Strap .. 2-15
2-7-4. Attaching a WRR-28L Wireless Receiver 2-15
2-8. Switches and Controls Setting on the Board .. 2-16
2-9. System Configuration 2-19

3. SERVICE INFORMATION

3-1. Board Layout 3-1
3-2. Replacement of Main Parts 3-2
3-2-1. Removal of Cabinet 3-2
3-2-2. To Extract the Boards 3-3
3-2-3. Replacement of DC-42 and DC-43 Boards 3-3
3-3. Servicing Precaution 3-5
3-3-1. Precautions on Replacement of CAMERA Connector (50P Connector) 3-5
3-3-2. Precaution on Replacement of Chip Parts 3-6
3-3-3. PROM IC 3-7
3-3-4. Precaution on Replacement Parts 3-7
3-4. Tools and Jigs 3-8

4. ALIGNMENT

4-1. Preparation 4-1
4-1-1. Equipment required 4-1
4-1-2. Notes on Adjustments 4-1
4-1-3. Connection 4-2
4-1-4. Initial Settings 4-2
4-2. Alignment Procedure 4-3
Step1. Power Supply System Adjustment 4-4
1-1. +9.5 V Adjustment 4-4
1-2. +9 V Adjustment 4-4
Step2. IF-227 Board Adjustment 4-5
2-1. H BLKG PHASE Adjustment 4-5
2-2. H BLKG WIDTH Adjustment 4-5
2-3. V BLKG WIDTH Adjustment 4-6
Step3. VA-80 Board Adjustment 4-7
3-1. SAMPLE Pulse (1) Adjustment 4-7
3-2. SAMPLE Pulse (2) Adjustment 4-8
3-3. SAMPLE Pulse (3) Adjustment 4-8
3-4. Y Gain Adjustment 4-9
3-5. R-Y Gain Adjustment 4-9
3-6. B-Y Gain Adjustment 4-10
3-7. Battery Alarm Set Adjustment 4-10
3-8. RET Video Gain Adjustment 4-11
Step4. MD-54 Board Adjustment 4-12
4-1. R. G. B Level Adjustment 4-12
4-2. Carrer Level Adjustment 4-13
4-3. SAMPLE Level Adjustment 4-13
4-4. SYNC Level Adjustment 4-14
4-5. RF Level Adjustment 4-14
Step5. MD-55 Board Adjustment 4-15
5-1. 36 MHz Adjustment (I) 4-15
5-2. 36 MHz Adjustment (II) 4-15
5-3. 18 MHz Adjustment 4-16
5-4. SYNC Level Adjustment 4-16
5-5. SAMPLE Level Adjustment 4-17
5-6. CHROMA RF Adjustment (I) 4-17
5-7. CHROMA RF Adjustment (II) 4-18

Step6. TR-47 Board Adjustment 4-19
6-1. Carrier Frequency Adjustment 4-19
6-2. RF Level Adjustment 4-19
6-3. Tuning Adjustment 4-20
6-4. H CONT Level Adjustment 4-20
6-5. MIC Level Adjustment 4-21
6-6. CHU INCOM Level Adjustment 4-21
6-7. CCU INCOM Demodulation Level Adjustment 4-22
6-8. PGM Demodulation Level Adjustment . 4-22
Step7. RX-6 Board Adjustment 4-23
7-1. PLL Free Run Frequency Adjustment . 4-23
7-2. Return Video Level Adjustment 4-23

A. BLOCK DIAGRAMS

MD-54/55 Block Diagram A-4
IF-227 Block Diagram A-7
VA-80 Block Diagram A-9
RX-6 Block Diagram A-11
PR-47 Block Diagram A-12

B. SEMICONDUCTOR PIN ASSIGNMENTS

C. SCHEMATIC DIAGRAMS AND BOARD ILLUSTRATIONS

RX-6 . . . . . C-3
TR-47 . . . . . C-7
MD-54/55 . . . . . C-13
IF-227 . . . . . C-21
VA-80 . . . . . C-27
DC-42 . . . . . C-31
DC-43 . . . . . C-35
FRAME C-40

D. SPARE PARTS

Parts Information D-1
Exploded View D-2
Screws D-8
Electrical Parts List D-9
Packing Materials & Supplied Accessories . . . D-22

SECTION 1 OPERATION

1-1. General

The CA-55P camera adaptor is used to connect a Betacam CCD color video camera, other than a BVP-5P, to a CCU-355 series camera control unit using a triaxial cable.

Features

Component signal transmission system

The component signal (Y/R-Y/B-Y) is transmitted through the triaxial cable.

Anti electrical-shock

The camera control unit (CCU) does not supply the high voltage if the connection is not complete.

Connectible to a portable VTR

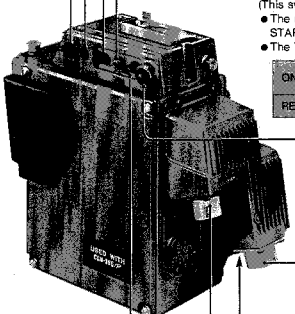
A CCZ or CCZQ cable is to be used to make connection.

Variety of input/output connectors

This adaptor is equipped with:

- Return video output connector (BNC)
- DC output connector to power a WRR-28L wireless receiver
- Signal input connector for remote-switching of return video 1 and 2
- DC output connector to power a large lens

1-2. Function of Parts



EARPHONE
Used to monitor the sound from the VTR. Connect an 8-ohm earphone.

CALL
When this button is pressed, the tally lamps on the CCU and on the viewfinder light up and the CCU operator is called.

INCOM LEVEL
Used to adjust the volume of the intercom.

TALK

ON	The cameraman's voice is transmitted to the CCU.
REMOTE	Transmission of the cameramas's voice to the CCU is controlled by the VTR START/STOP button located on the camera or on the lens.

When you set the S1 switch on the VA-80 board to the RETURN position:
(This switch is factory-set to the INCOM position.)
- The return video 2 is switched on and off with the VTR START/STOP button located on the camera or on the lens.
- The TALK switch functions as follows:

ON	The cameraman's voice is transmitted to the CCU.
REMOTE	The cameraman's voice is not transmitted.

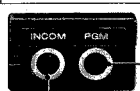
POWER

CCU	Power is turned on when a CCU is connected.
OFF	Power is turned off.
EXT (external)	Power is turned on when a CCU is not connected.

VTR
See page 1-8 (E).

PGM (program) LEVEL
Used to adjust the program audio level.

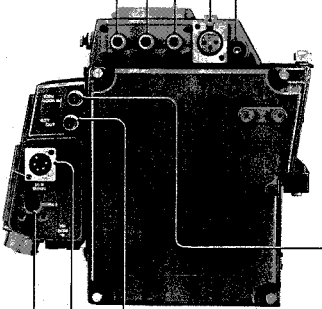
CCU-355/P
See page 1-8 (E).



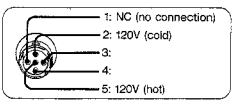
PGM (program)
Used to connect a headset to receive the program audio.

INCOM
Used to connect a headset to transmit/receive over the intercom.

When the microphone of the headset you are going to use is a dynamic microphone, detach the side panel of the CA-55P and set the MIC switch to the D (dynamic) position. (The switch is factory-set to the C (carbon) position.)
For details, see "2. Installation."

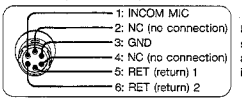


DC OUT 120V



DC OUT 10.5~17V (10.5 to 17V)
Supplies DC power to the WRR-28L wireless receiver.

RET CONT (return control)



Used to input the signal for selecting the return video and for turning on/off the intercom microphone.

MIC IN
An external microphone can be connected to this connector.
The source of the output signal is selected with the switch.

INT (internal)	The microphone attached to the camera
EXT (external)	The external microphone

When a microphone which can be operated using a phantom power system is to be connected, detach the side panel of the CA-55P and set the MIC POWER switch to ON. Power (+48V) will be supplied to the microphone via the connector.
Be sure to set the switch to OFF when a microphone of another type is to be used.
For details, see "2. Installation".

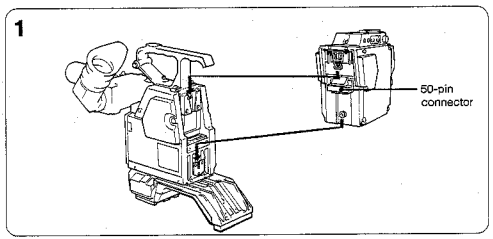
GENLOCK IN
Used to input an external sync signal. However, when a CCU is connected, the camera signal does not lock to the external sync signal.

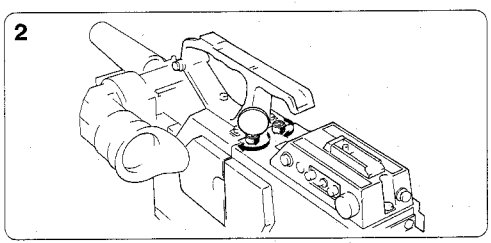
RET (return) OUT
Normally, outputs the return video 1 signal. However, while the RET 2 button is depressed, this outputs the return video 2 signal.

DC IN 10.5~17V (10.5 to 17V)
See page 1-8 (E).

RET (return) 2
While this button is depressed, the return video 2 signal can be monitored on the viewfinder screen.

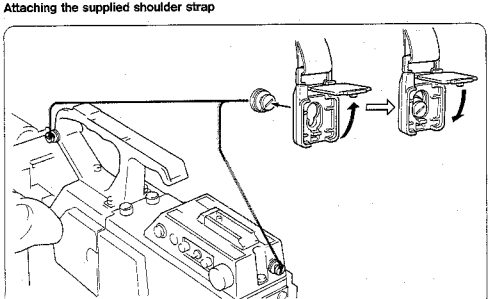
1-3. Attaching the CA-55P to the Camera



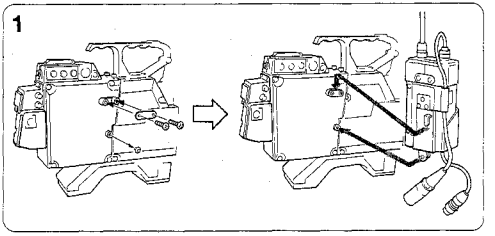


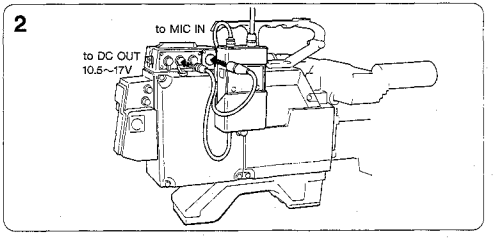
When the CA-55P is mounted on the camera, the 50-pin connector of one unit is connected to the 50-pin connector of the other.

Attaching the supplied shoulder strap

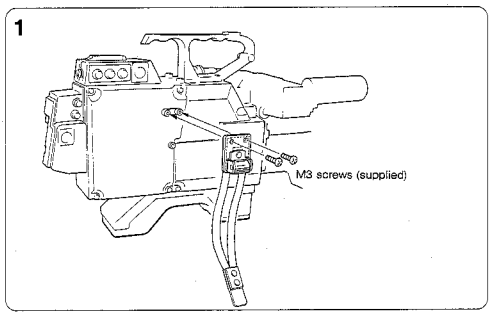


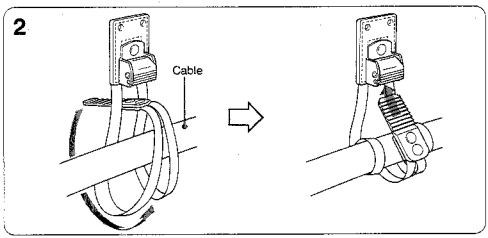
Attaching a WRR-28L wireless receiver



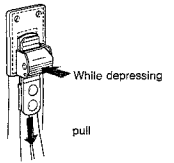


Using the supplied cable clamp

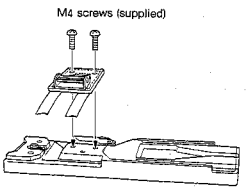




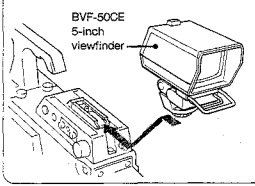
to detach the cable



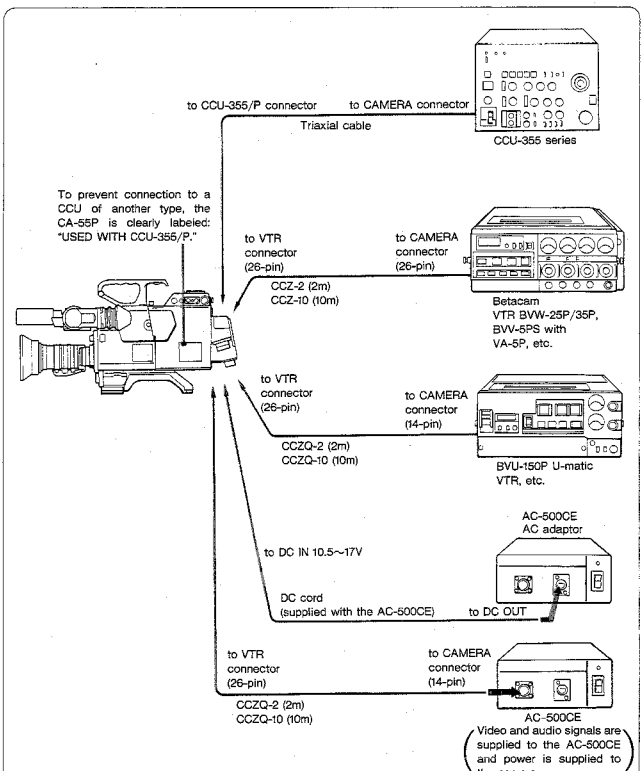
Also attachable to the VCT-13/14 tripod attachment



Viewfinder shoe



1-4. Connections


to CCU-355/P connector
to CAMERA connector
Triaxial cable
CCU-355 series
To prevent connection to a CCU of another type, the CA-55P is clearly labeled: "USED WITH CCU-355/P."
to VTR connector (26-pin)
to CAMERA connector (26-pin)
CCZ-2 (2m)
CCZ-10 (10m)
Betacam VTR BVW-25P/35P, BVV-5PS with VA-5P, etc.
to VTR connector (26-pin)
to CAMERA connector (14-pin)
CCZQ-2 (2m)
CCZQ-10 (10m)
BVU-150P U-matic VTR, etc.
AC-500CE AC adaptor
to DC IN 10.5~17V
DC cord (supplied with the AC-500CE)
to DC OUT
to VTR connector (26-pin)
to CAMERA connector (14-pin)
CCZQ-2 (2m)
CCZQ-10 (10m)
AC-500CE
Video and audio signals are supplied to the AC-500CE and power is supplied to the camera.

Note

When a CCU is connected, do not connect other equipment to the VTR connector nor to the DC IN 10.5~17V connector. If you connect, the camera will not operate correctly.
If a CCU and VTR are connected at the same time, set the S1(POWER SAVE) switch on the HN board to the OFF position.
For details, see "2. Installation."

If the CA-55P is attached to a BVP-50P in which a BKP-501 board is not installed

For connecting a CCU to the CA-55P, set the sixth switch in the group of S1s, located on the IF board of the CA-55P, to the OFF position. For details, see "2. Installation."

Power Supply

When a CCU is connected

Power is supplied to the camera from the CCU.

When a VTR is connected

Power is supplied from the VTR to the camera. However, if a power supply (an AC-500CE or a battery pack) is connected to the DC IN connector, power is supplied from the connected equipment.

Battery packs

BP-90

Attach a DC-300 battery case to the CA-55P or use a DC-210 battery belt.

Two NP-1s

Attach a DC-310 battery case to the CA-55P.

For details on how to attach the battery case, see the instruction manual supplied with the battery case.

Notes

- Do not use a BVF-50CE when power will be supplied from a portable VTR, because the portable VTR cannot supply sufficient power.
- Supply power to the camera independently when a 10m-cable is used for connecting a VTR.
  If you do not, the battery will run down quickly and the battery life will be shortened.

When a CCU and VTR are connected at the same time.(For details, see "2. Installation.")

When you set the POWER switch to the CCU position, power is supplied to the camera from the CCU.

When a VTR is connected

When you set the POWER switch to the EXT position, power is supplied from the VTR to the camera. However, if a power supply (an AC-500CE or a battery pack) is connected to the DC IN connector, power is supplied from the connected equipment.

If the holder of an old-type DC-300 does not match the camera, it must be replaced. Consult qualified Sony personnel.

1-5. Scene File

Scene file function is available when the CA-55P is attached to a BVP-7P and connected to a CCU-355P with a BKP-3601L (or another remote control panel.)

Contents

White (R, B)	TEST signal ON/OFF
Black (R, B)	Color bars signal ON/OFF
Gamma (R, B, Master)	Master gain
Flare (R, B)	Detail OFF
Iris	Auto knee ON
Master black	Shutter ON/OFF, speed
Detail	
Master knee	

See the operation manual of the connected equipment for controllable functions.

1-6. Specifications

Input/output connectors

GENLOCK IN	BNC type, 1Vp-p, 75 ohms, unbalanced
MIC IN	XLR 3-pin, female, 600 ohms, balanced
RET CONT	6-pin
DC IN 10.5~17V	XLR 4-pin, DC 10.5 to 17V
RET OUT	BNC type, 1Vp-p, 75 ohms, unbalanced
EARPHONE	Minijack, 8-ohm impedance load
DC OUT 120V	5-pin
DC OUT 10.5~17V	4-pin
INCOM	Microphone: carbon/dynamic (selectable)
PGM	
CCU-355/P	Triaxial
VTR	Z-type, 26-pin

General

Power consumption	7.5W
Dimensions	228 x 221 x 103 mm (w/h/d)
	(9 x 8 3/4 x 4 1/8 inches)
Weight	3kg (6 lb 10 oz)
Operating temperature	
	−20°C to +45°C (−4°F to +113°F)
Storage temperature	−20°C to +50°C (−4°F to +122°F)
Supplied parts	Shoulder strap (1)
	Cable clamp (1)
	M3/M4 screws for attaching the cable clamp (2,each)
	Extension board (1)
	Operation and maintenance manual (1)

Design and specifications are subject to change without notice.

TEIL 1 BETRIEB

1-1. Überblick

Der Kameraadapter CA-55P ermöglicht es, eine Betacam-CCD-Videokamera (außer BVP-5P) über ein Triaxkabel mit einer Kamera-Steuereinheit der CCU-355-Serie zu verbinden.

Merkmale

Übertragung eines Komponentensignals

Über das Triaxkabel kann ein Komponentensignal (Y/R-Y/B-Y) übertragen werden.

Hochspannungsschutz

Die Kamera-Steuereinheit (CCU) liefert die Hochspannung nur, wenn alle Anschlüsse hergestellt sind.

Anschlußmöglichkeit eines portablen Videorecorders

Zum Anschluß kann ein CCZ- oder CCZQ-Kabel verwendet werden.

Verschiedene Eingänge und Ausgänge

Der Adapter ist mit folgenden Buchsen ausgestattet:

- Rücklaufvideoausgang (BNC).
- Gleichspannungsausgang zur Versorgung des Fernbedienungs-Receivers WRR-28L.
- Fernsteuereingang für Umschaltsignal von Rücklaufvideo 1 und 2.
- Gleichspannungsausgang zur Versorgung eines großen Objektivs.

1-2. Funktion der Teile

Ohrhörerbuchse (EARPHONE)
Zum Anschluß eines 8-Ohm-Ohrhörers, über den der Ton des Videorecorders überwacht werden kann.

Ruftaste (CALL)
Zum Rufen des CCU-Bedienpersonals: Beim Drücken der Taste leuchtet die Signallampe an der CCU und am Sucher auf.

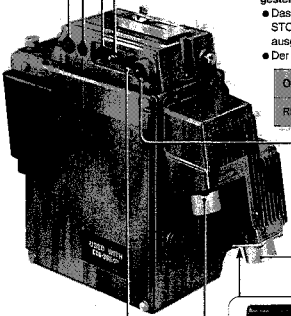
Sprechverkehr-Pegelregler (INCOM LEVEL)
Zur Einstellung der Sprechverkehr-Lautstärke.

Sprechschalter (TALK)

ON	Die Stimme des Kameramanns wird direkt zur CCU übertragen.
REMOTE	Die Übertragung der Stimme des Kameramanns zur CCU wird durch die VTR START/STOP-Taste an der Kamera oder am Objektiv gesteuert.

Wenn der Schalter S1 an der Leiterplatte VA-80 auf RETURN gestellt wird (werksseitig steht der Schalter auf INCOM):
- Das Rücklaufvideosignal 2 wird an der VTR START/STOP-Taste an der Kamera oder am Objektiv ein- und ausgeschaltet.
- Der TALK-Schalter besitzt die folgende Funktion:

ON	Die Stimme des Kameramanns wird zur CCU übertragen.
REMOTE	Die Stimme des Kameramanns wird nicht übertragen.



Ein/Aus-Schalter (POWER)

CCU	Das Gerät ist eingeschaltet, wenn die CCU angeschlossen ist.
OFF	Das Gerät ist ausgeschaltet.
EXT	Das Gerät ist eingeschaltet, wenn die CCU nicht angeschlossen ist.

Videorecorderbuchse (VTR)
Siehe Seite 1-8 (G).

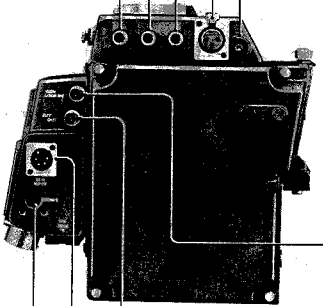
Programmton-Pegelregler (PGM LEVEL)
Zur Einstellung der Programmton-Lautstärke.

CCU-355/P-Buchse
Siehe Seite 1-8 (G).

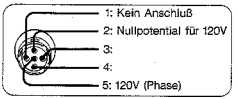
Programmtonbuchse (PGM)
Zum Anschluß eines Kopfhörers zum Hören des Programmtons.

Sprechverkehrbuchse (INCOM)
Zum Anschluß einer Hör-Sprechgarnitur für den Sprechverkehr.

Wenn die Hör-Sprechgarnitur mit einem dynamischen Mikrofon bestückt ist, nehmen Sie das Seitenteil der CA-55P ab und stellen Sie den MIC-Schalter auf D (dynamisch); werksseitig steht der Schalter auf C (Carbon).
Genaueres siehe unter „2. Installation".

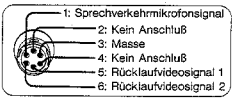


Gleichspannungsausgang (DC OUT 120V)



Gleichspannungsausgang (DC OUT 10.5~17V)
Dieser Ausgang liefert die Versorgungs-Gleichspannung für den Fernbedienungs-Receiver WRR-28L.

Rücklaufvideobuchse (RET CONT)



Zur Zuleitung des Rücklaufvideo-Umschaltsignals und zum Ein- und Ausschalten des Sprechverkehrmikrofons.

Mikrofoneingang (MIC IN)
Zum Anschluß eines externen Mikrofons. An einem Schalter kann gewählt werden, welches Mikrofon aktiviert wird.

INT	Das an der Kamera angebaute Mikrofon.
EXT	Das externe Mikrofon.

Bei Verwendung eines Mikrofons mit Phantomspeisung nehmen Sie das Seitenteil des CA-55P ab und stellen Sie den MIC POWER-Schalter auf ON. Das Mikrofon wird dann über die MIC IN-Buchse versorgt (+48V). **Bei Verwendung eines anderen Mikrofons darf nicht vergessen werden, den Schalter wieder auf OFF zu stellen.**
Genaueres siehe unter „2. Installation".

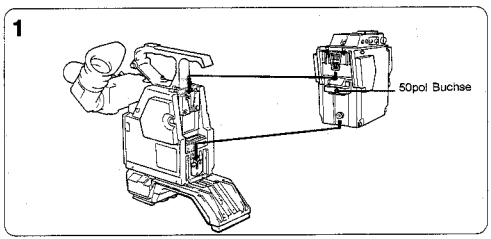
Synchronsignaleingang (GENLOCK IN)
Zur Zuleitung eines externen Synchronsignals. Zu Beachten ist jedoch, daß das Kamerasignal nicht mit dem externen Synchronsignal gekoppelt wird, wenn eine CCU angeschlossen ist.

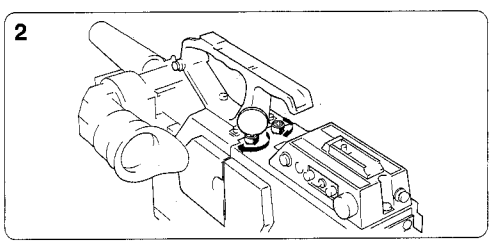
Rücklaufvideoausgang (RET OUT)
Normalerweise gibt die Buchse das Rücklaufvideosignal 1 aus. Nur wenn die RET 2-Taste gedrückt wird, liefert die Buchse das Rücklaufvideosignal 2.

Gleichspannungseingang (DC IN 10.5~17V)
Siehe Seite 1-8 (G).

Rücklaufvideosignal 2-Schalter (RET 2)
Wenn diese Taste gedrückt wird, ist auf dem Sucherschirm das Rücklaufvideosignal 2 zu sehen.

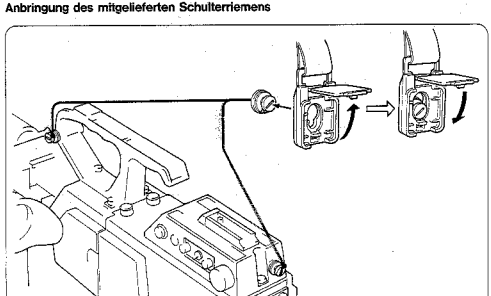
1-3. Anbringung des CA-55P an der Kamera

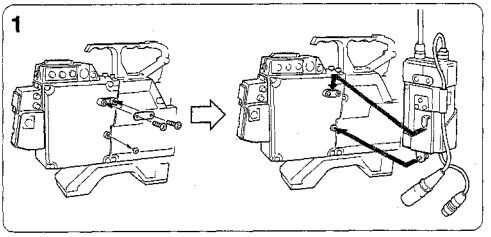


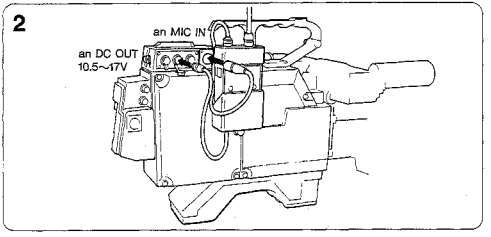


Bei Montage des CA-55P an die Kamera wird die 50pol Buchse der einen Einheit mit der 50pol Buchse der anderen verbunden.

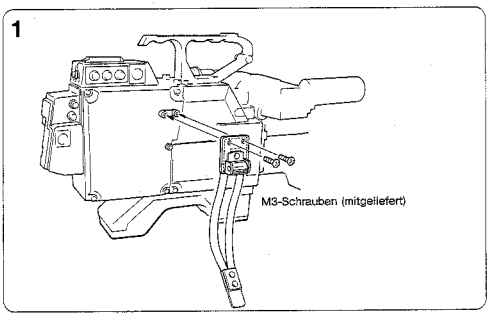
Anbringung des mitgelieferten Schulterriemens

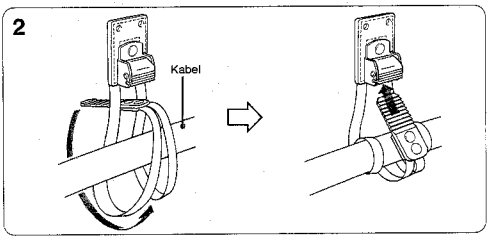



1

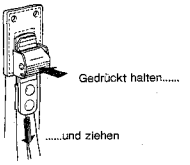

2
an MIC IN
an DC OUT
10.5~17V

Verwendung der mitgelieferten Kabelklemme

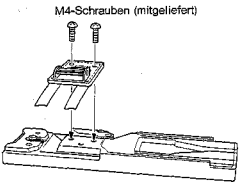




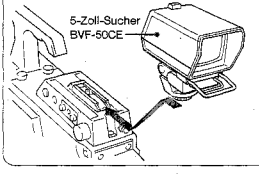
Zum Abnehmen des Kabels



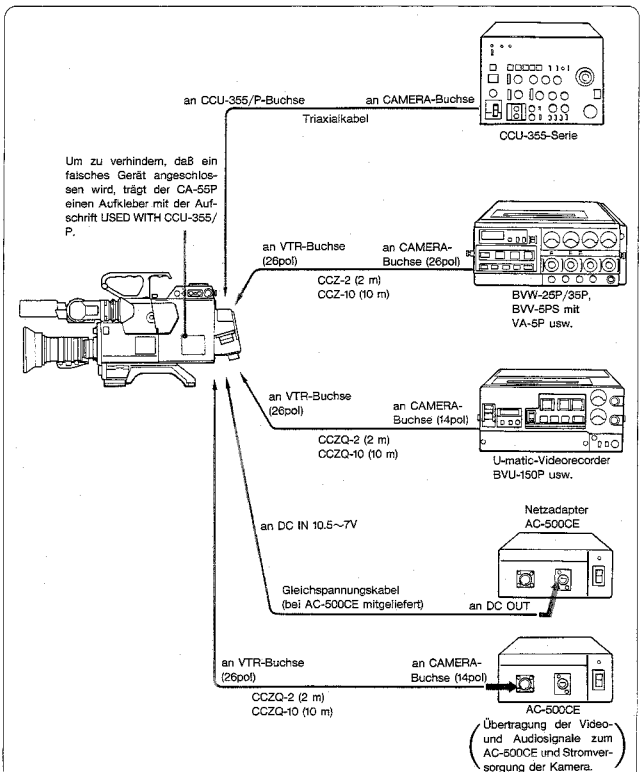
Ebenfalls anbringbar an der Stativaufnahme VCT-13/14



Sucherschuh



1-4. Anschluß



Hinweis

Wenn eine CCU angeschlossen ist, darf weder an die VTR-Buchse noch an die DC IN 10.5~17 V-Buchse ein Gerät angeschlossen werden, da sonst die Kamera nicht einwandfrei arbeitet.
Wenn beide (CCU und Videorecorder) gleichzeitig angeschlossen sind, den Schalter S1 (POWER SAVE) der HN-Leiterplatte auf OFF stellen. Näheres hierzu unter "2. Installation."

Wenn der CA-55P an einer BVP-50P ohne installierte BKP-501 angebracht wird

Soll eine CCU an den CA-55P angeschlossen werden, stellen Sie den sechsten Schalter der S1-Gruppe (auf der IF-Leiterplatte des CA-55P) auf OFF. Genaueres siehe unter „2. Installation".

Stromversorgung

Bei Anschluß der CCU

Die Stromversorgung der Kamera erfolgt an der CCU.

Bei Anschluß eines Videorecorders

Die Stromversorgung der Kamera erfolgt vom Videorecorder. Wenn jedoch eine andere Stromversorgungsquelle (AC-500CE oder Akku) an der DC IN-Buchse angeschlossen wird, übernimmt diese die Stromversorgung.

Versorgung durch Akku

BP-90

Bringen Sie den Akkubehälter DC-300 am CA-55P an oder verwenden Sie den Akkugürtel DC-210.

2 NP-1

Bringen Sie den Akkubehälter DC-310 am CA-55P an.

Genaueres zur Anbringung des Akkubehälters kann der mitgelieferten Anleitung entnommen werden.

Hinweise

- Wenn ein portabler Videorecorder die Stromversorgung übernimmt, kann der Sucher BVF-50CE nicht verwendet werden, da die Stromversorgung nicht ausreicht.
- Wenn zum Anschluß des Videorecorders ein über 10 m langes Kabel verwendet wird, sollte die Kamera getrennt mit Strom versorgt werden, da sonst der Akku zu schnell entladen wird und sich seine Lebensdauer verkürzt.

Bei gleichzeitigem Anschluß von CCU und Videorecorder (Näheres hierzu unter "2. Installation")

Wenn Sie den POWER-Schalter auf CCU stellen, erfolgt die Stromversorgung der Kamera über die CCU.

Bei Anschluß eines Videorecorders

Wenn Sie den POWER-Schalter auf EXT stellen, erfolgt die Stromversorgung der Kamera vom Videorecorder. Wenn jedoch eine andere Stromversorgungsquelle (AC-500CE oder Akku) an der DC IN-Buchse angeschlossen wird, übernimmt diese die Stromversorgung.

Die Halterung eines älteren DC-300 paßt möglicherweise nicht an die Kamera und muß ausgewechselt werden. Wenden Sie sich hierzu an einen Sony Fachmann.

1-5. Szenen-Datei

Szenen-Dateien können verarbeitet werden, wenn die BVP-7P mit angebrachtem CA-55P an die CCU-355P und eine Fernsteuereinheit (z.B. BKP-3601L) angeschlossen ist.

Inhalt

Weiß (R, B)	Ein/Aus für Testsignal
Schwarz (R, B)	Ein/Aus für Farbbalkensignal
Gamma (R, B, Master)	Hauptverstärkung
Flare (R, B)	Aus für Detail
Blende	Ein für Kniewertautomatik
Hauptschwarzwert	Ein/Aus Belichtungszeitänderung, Einstellung der Belichtungszeit
Detail	
Hauptkniewert	

Einzelheiten bezüglich der steuerbaren Funktionen entnehmen Sie bitte den Anleitungen der betreffenden Geräte.

1-6. Technische Daten

Eingänge und Ausgänge

GENLOCK IN	BNC-Typ, 1 Vss, 75 Ohm, unsymmetrisch
MIC IN	XLR 3pol, Buchse, 600 Ohm, symmetrisch
RET CONT	6pol
DC IN 10.5~17V	XLR 4pol, 10.5 bis 17 V Gleichspannung
RET OUT	BNC-Buchse, 1 Vss, 75 Ohm, unsymmetrisch
EARPHONE	Minibuchse, 8 Ohm, Lastimpedanz
DC OUT 120 V	5pol
DC OUT 10.5~17V	4pol
INCOM PGM	Mikrofon: Carbon/dynamisch (wählbar)
CCU-355/P	Triaxial
VTR	Z-Typ, 26pol

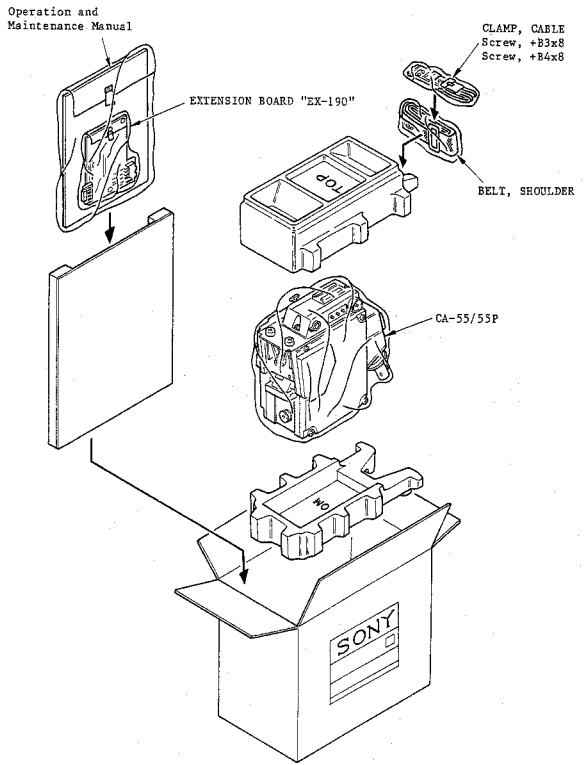
Allgemeines

Leistungsaufnahme	7,5 W
Abmessungen	228 x 221 x 103 mm (B/H/T)
Gewicht	3 kg
Betriebstemperatur	−20°C bis +45°C
Lagertemperatur	−20°C bis +50°C
Mitgelieferte Teile	Schulterriemen (1) Kabelklemme (1) M3/M4-Schrauben zur Anbringung der Kabelklemme (je 2) Erweiterungs-Leiterplatte (1) Bedienungs- und Wartungsanleitung (1)

Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.

SECTION 2
INSTALLATION

2-1. UNPACKING AND REPACKING

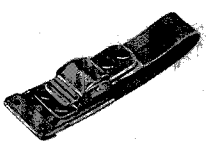


2-2. SUPPLIED ACCESSORIES

Belt, Shoulder: x 1

Used for shouldering the Betacam camera (BVP-50/7) with the CA-55/55P attached using it.

Clamp, Cable: x 1



Screw, M3: x 2

Used for attaching the clamp, cable to the CA-55/55P.

Screw, M4: x 2

Used for attaching the clamp, cable to the VCT-13/14 tripod attachment.

Operation and Maintenance Manual: x 1

Instruction and Service manual for CA-55/55P.

2-3. CONNECTORS/CABLE

2-3-1. Connector Input/Output signals

The main connector input/output signals are as follows;

GENLOCK IN BNC type, VBS 1Vp-p, Zo=75ohm, Unbalanced

RET OUT BNC type, VBS 1Vp-p, Zo=75ohm, Unbalanced

CCU Triaxial

PGM/INCOM Jack, Phone
Input impedance 5kohm to 10kohm
Output impedance 300ohm, unbalanced
Input level 200mVp-p (at 1kHz)
Output level Max 1.7Vp-p (at 1kHz)

CAMERA (50P, FEMALE)

(EXT VIEW)

PIN No.	SIGNAL	REMARK FOR SIGNAL
1	GEN LOCK OUT (X)	VBS 1 Vp-p, Zo=75Ω
2	GEN LOCK OUT (G)	
3	+8.8 V IN	DC +8.8 V
4	−5.0 V IN	DC −5.0 V
5	UNREG (GND)	GND for UNREG
6	UNREG (GND)	
7	R VIDEO IN (X)	V 0.7 Vp-p, Zi≧10 kΩ
8	G VIDEO IN (X)	
9	B VIDEO IN (X)	
10	RGB VIDEO IN (G)	GND for R, G, B VIDEO
11	(Spare)	
12	(Spare)	
13	(Spare)	
14	SD IN/OUT	Serial data for camera control
15	MIC IN (G)	Zi≦600Ω, −60 dBm balanced
16	MIC IN (X)	
17	MIC IN (Y)	

PIN No.	SIGNAL	REMARK FOR SIGNAL
18	RET VIDEO OUT (X)	V 1.0 Vp-p, Zo=75Ω
19	RET VIDEO OUT (G)	
20	ZEBRA/AUDIO OUT	AUDIO Zo≧1 kΩ
21	(Spare)	
22	TAPE IND 2 OUT	ON: +4.5 V, OFF: GND or OPEN
23	(Spare)	
24	REC ALARM OUT	ON: +5 V, OFF: +2.5 V or 0 V, Zo≧20 kΩ
25	BATT IND OUT	ON: +5 V, OFF: 0 V or OPEN, Zo=300Ω
26	PB REF OUT	PB: +4.5 V, CAM: 0 V or OPEN
27	VTR START/STOP IN	START: 4.5±0.5 Vdc, STOP: 0±0.5 Vdc, Zi≦10 kΩ
28	(Spare)	
29	R-Y VIDEO IN (X)	Zi=1 kΩ 700 mVp-p (CA-55) 525 mVp-p (CA-55P) (75% COLOR BARS)
30	R-Y VIDEO IN (G)	
31	AUDIO CONT IN	0 V (0 dB) ~ 7 V (−20 dB)
32	VTR SAVE IN	SAVE: +4.5 V, STAND BY: 0 V, Zi≦10 kΩ
33	AUDIO MONITOR OUT	No connection
34	SYNC (VTR) IN	5 Vp-p, Negative pulse, Zi≦100Ω
35	(Spare)	
36	SHUT CLOSE OUT	No connection
37	CF IN	Color Framing
38	RET VIDEO ENABLE IN	ENABLE: 0 V, DISABLE: +5 V or OPEN
39	UNREG OUT	+10.6 V ~ +17 V
40	UNREG OUT	
41	Y VIDEO IN (X)	VS 1.0 Vp-p, Zi=1 kΩ
42	Y VIDEO IN (G)	
43	VBS IN (X)	VBS 1.0 Vp-p, Zi=75Ω
44	VBS IN (G)	
45	(Spare)	
46	(Spare)	
47	(Spare)	
48	(Spare)	
49	B-Y VIDEO IN (X)	Zi=1 kΩ 700 mVp-p (CA-55) 525 mVp-p (CA-55P) (75% COLOR BARS)
50	B-Y VIDEO IN (G)	

VTR (26P, MALE)

(EXT VIEW)

PIN No.	SIGNAL	REMARK FOR SIGNAL
A	POWER (+) IN	UNREG 10.5 V ~ 17 V,
B	POWER (−) IN	
1	VBS OUT (X)	VBS 1.0 Vp-p, Zo=75Ω
2	VBS OUT (G)	
3	Y VIDEO OUT (G)	VS 1.0 Vp-p, Zo=75Ω
4	Y VIDEO OUT (X)	
5	R-Y VIDEO OUT (X)	Zo=75Ω 700 mVp-p (CA-55) 525 mVp-p (CA-55P) (75% COLOR BARS)
6	R-Y VIDEO OUT (G)	
7	B-Y VIDEO OUT (X)	
8	B-Y VIDEO OUT (G)	
9	MIC OUT (X)	Zo≦600Ω, −60 dBm balanced
10	MIC OUT (Y)	
11	MIC OUT (G)	
12	VTR START/STOP OUT	START: 4.5±0.5 Vdc, STOP: 0±0.5 Vdc, Zo≦10 kΩ
13	BATT IND IN	Note 1), Zi=300Ω
14	(SPARE)	
15	REC ALARM IN	Note 2), Zi≧20 kΩ
16	(SPARE)	
17	GEN (SHIELD)	
18	RET VIDEO IN (X)	V 1.0 Vp-p, Zi=75Ω
19	RET VIDEO IN (G)	
20	AUDIO MONITOR IN/VTR SAVE OUT	SAVE: +4.5 V STANDBY: 0 V } ,Zo≦10 kΩ MONITOR: No connection
21	(SPARE)	
22	COLOR FRAMING PULSE OUT	Color Framing
23	(SPARE)	
24	(SPARE)	

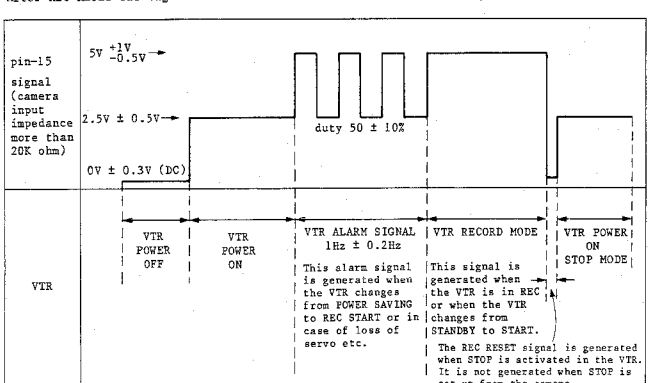
Note 1. Signal at Pin 13

Battery voltage detection and warning signal generating circuits are located within the VTR. This signals are supplied from the VTR to the camera to either blink or light the LED at the bottom of the viewfinder.

BATTERY TERMINAL ADAPTOR (VTR INTERNAL BATTERY)	DC12V to 11.1V	DC11.1V to 10.8V	PIN 13 TURNS HIGH AT DC 10.8V, 10.6V DC or below the VTR Internal Power is cut off so that the Battery Power is sent to Pin 13.
PIN 13 OUTPUT FROM VTR	0V	1Hz ± 0.2Hz duty 50 ± 10%	DC2 to 3V across 300 ohm
LED IN VIEWFINDER	NEITHER BLINKS NOR LIGHTS	BLINKS AT 1Hz	LIGHTS

Note 2. Signal at Pin 15

When the VTR is ON, the input to the camera at pin 15 is 2.5V DC. In VTR record mode the voltage is 5V DC. When servo is not applied or if alarm signals are generated within the VTR, an alternating 1Hz signal (2.5Vp-p with 2.5V DC as reference) is sent to the camera. At the tape end when the VTR enters Stop mode or when setting up the Stop mode from the VTR, 0V DC is generated from 10msec to 100msec (called REC RESET). After REC RESET the signal level returns to 2.5V DC.

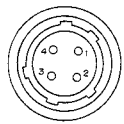

pin-15 signal (camera input impedance more than 20K ohm)
5V +1V -0.5V
2.5V ± 0.5V
0V ± 0.3V (DC)
duty 50 ± 10%
VTR
VTR POWER OFF
VTR POWER ON
VTR ALARM SIGNAL 1Hz ± 0.2Hz
This alarm signal is generated when the VTR changes from POWER SAVING to REC START or in case of loss of servo etc.
VTR RECORD MODE
This signal is generated when the VTR is in REC or when the VIR changes from STANDBY to START.
The REC RESET signal is generated when STOP is activated in the VTR. It is not generated when STOP is set up from the camera.
VTR POWER ON STOP MODE

MIC IN (3P, FEMALE)

(EXT VIEW)

PIN No.	SIGNAL	REMARK FOR SIGNAL
1	MIC IN (G)	600Ω, −60 dB
2	MIC IN (X)	
3	MIC IN (Y)	

DC OUT (10.5V-17V)(4P, FEMALE)



(EXT VIEW)

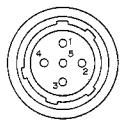
PIN No.	SIGNAL	REMARK FOR SIGNAL
1	GND	GND for DC (+)
2	(SPARE)	
3	(SPARE)	
4	DC (+) OUT	DC 10.5 ~ 17.0 V

DC IN(4P, MALE)

(EXT VIEW)

PIN No.	SIGNAL	REMARK FOR SIGNAL
1	GND	GND for DC (+)
2	(SPARE)	
3	(SPARE)	
4	DC (+) IN	DC 10.5 ~ 17.0 V

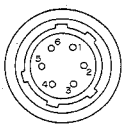
DC OUT (120V) (5P, FEMALE)



(EXT VIEW)

PIN No.	SIGNAL	REMARK FOR SIGNAL
1	(SPARE)	
2	120 V OUT (C)	GND
3		
4		
5	120 V OUT (H)	DC 120V

RET CONT (6P, FEMALE)



(EXT VIEW)

PIN No.	SIGNAL	REMARK FOR SIGNAL
1	INCOM MIC ON/OFF IN (X)	ON: 0 V, Zo≦10 kΩ
2	(SPARE)	
3	INCOM MIC ON/OFF IN (G)	GND
4	(SPARE)	
5	RET 1 CONT IN	ON: 0 V, Zi≦10kΩ
6	RET 2 CONT IN	ON: 0 V, Zi≦10kΩ

INCOM/PGM (5P, FEMALE) (only UC)

(EXT VIEW)

PIN No.	SIGNAL	REMARK FOR SIGNAL
1	INCOM TALK IN (X)	0 dBm, 600Ω
2	INCOM TALK IN (Y)	Unbalanced
3	GND	GND for INCOM/PGM
4	INCOM RECEIVE OUT (X)	0 dBm, 600Ω
5	PGM IN (X)	0 dBm, Unbalanced

2-3-2. Connector

When cables with connectors are set to the respective connectors on the connector panel during installation or service, the specified or equivalent connectors with cables, or the specified cable assemblies should be used, these are listed as follows;

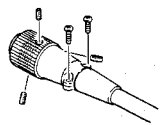
Connector Function	Parts No. and Name of Connector with Cable	
RET OUT GENLOCK IN (BNC)	1-560-069-11 PLUG, BNC or B-B cable assembly (Cable length 1.5 m, optional)	
CCU (TRIAX)	CCT Cable assembly (Optional, by FISCHER) CCT-50 (50 m/164 feet) CCT-100 (100 m/328 feet) CCT-150 (150 m/492 feet) CCT-300 (300 m/984 feet)	CCT (K) Cable assembly (Optional, by KINGS) CCT-K50 (50 m/164 feet) CCT-K100 (100 m/328 feet) CCT-K150 (150 m/492 feet) CCT-K300 (300 m/984 feet)
VTR (26P, MALE)	1-564-184-00 CONNECTOR, 26PIN, FEMALE 1-564-183-00 CONNECTOR, 26PIN, MALE 1-508-929-00 CONNECTOR, 14PIN, MALE or cable assembly (optional) • For 26PIN-VTR use CCZ-2 (2 m) CCZ-10 (10 m) • For 14PIN-VTR use CCZQ-2 (2 m) CCZQ-10 (10 m)	
MIC IN (For J model) (3P, MALE)	1-508-083-11 XLR-3P, FEMALE CANON XLR-3-11C or equivalent	
MIC IN (For UC/EK model) (3P, FAMALE)	1-508-084-11 XLR-3P, MALE CANON XLR-3-12C or equivalent	
DC IN (4P, MALE)	1-508-362-11 XLR-4-11C, FEMALE or Cable assembly (Supplied with AC-500) 1-551-577-00 Cable with XLR plugs (Cable length 2 m)	
DC OUT (10.5 V −17 V) (4P, FEMALE)	1-566-425-11 PLUG, 4P, MALE (HIROSE HR-10A-7P-4PB or equivalent)	
DC OUT (120 V) (5P, FEMALE)		
RET CONT (6P, FEMALE)	1-566-365-11 PLUG, 6P, MALE (HIROSE HR-10A-7P-6P or equivalent)	
INCOM/PGM (For UC model) (5P, FEMALE)	1-508-363-11 XLR-5-11C, FEMALE	
INCOM PGM (For J/EK model) (JACK)		

2-3-3. Removal of the CCZ,CCZQ connectors

CCZ, CCZQ Connectors (Removal of the connector)

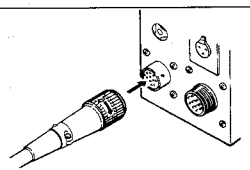
Step 1.

Remove the three hexagonal setscrews and the two setscrews.



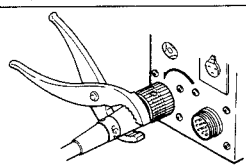
Step 2.

Fix the CCZ connector at the camera or VTR connector.



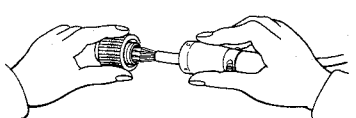
Step 3.

Rotate the CCZ connector counterclockwise by the plier and loosen it.



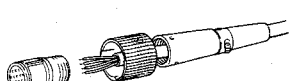
Step 4.

It can be removed by hand and unsolder.

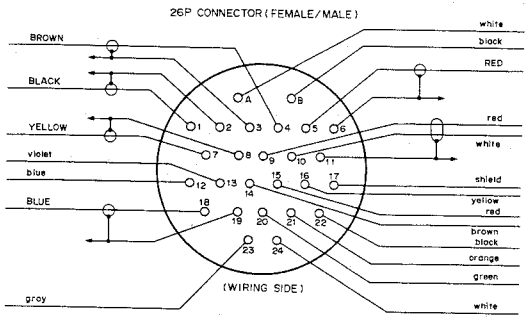


Step 5.

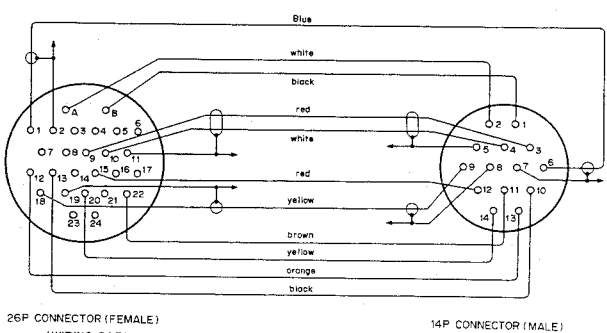
It can be broken up as shown in Figure.



CCZ cable (wiring diagram)

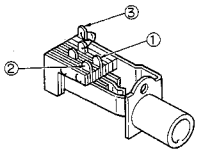


CCZQ cable (wiring diagram)

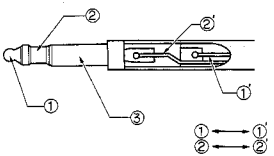


2-3-4. Connection of INCOM/PGM terminal (only EK)

INCOM/PGM Jack (wiring diagram)



INCOM/PGM Plug (wiring diagram)



Pin No.	Signal
①	INCOM TALK IN (X)
②	INCOM RECEIVE OUT (X)
	PGM IN (X)
③	INCOM TALK IN (G) INCOM RECEIVE OUT (G)
	PGM IN (G)

2-4. POWER SUPPLY

Power sources DC +12V (DC +10.5V to +17V)

1. DC voltage is supplied from the camera control unit CCU-355 via . CCU terminal by using triaxial cable.
2. DC voltage is supplied from the AC adaptor AC-500 via VTR terminal by using CCZ/CCZQ cable.
3. DC voltage is supplied from the AC adaptor AC-500 or DC battery DC-300/310 via DC IN terminal.

2-5. OPERATIONAL ACCESSORIES

Camera cable CCZ-2 (2m)
CCZ-10 (10m)
Used for connecting the CA-55/55P and BVW-1/1PS/1A/1APS/5/5PS or BVW-25/35 VTR.

Camera cable CCZQ-2 (2m)
CCZQ-10 (10m)

Used for connecting the CA-55/55P and portable VTR (BVU-110/110PS/150/150PS, BVH-500,etc.)

Camera cable Triaxial cable assembly
CCT-50 (50m), CCT-K50 (50m)
CCT-100 (100m), CCT-K100 (100m)
CCT-150 (150m), CCT-K150 (150m)
CCT-300 (300m), CCT-K300 (300m)
Used for connecting the CA-55/55P and CCU-355/355P.

Color video camera BVP-50/50P, BVP-7/7P
Camera Control Unit CCU-355/355P
Battery Case DC-300 (For battery BP-90A)
Battery Case DC-210 (For battery BP-90A)
Battery Case DC-310 (For battery NP-1A)
Battery NP-1A
Battery BP-90A

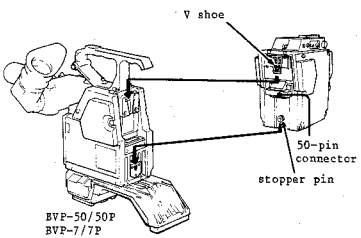
2-6. OPERATING CONDITIONS

Operating temperature	-20°C to +45°C
Storage temperature	-20°C to +50°C
Humidity	Non condense

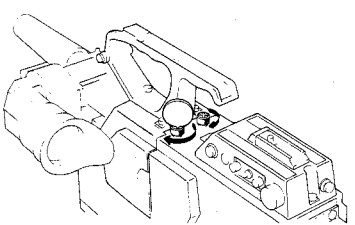
2-7. SET-UP

2-7-1. Set up with the BVP-50/50P/7/7P camera

1. Attach the CA-55/55P to the camera.

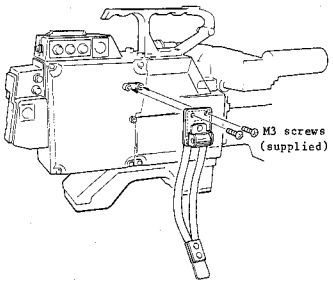


2. Tighten the two screws by using a coin securely.

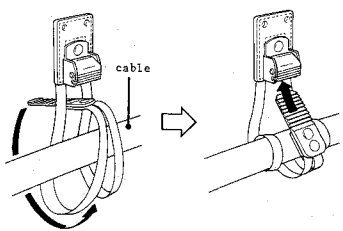


2-7-2. Using the supplied cable clamp

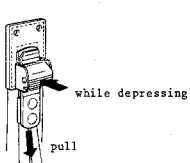
1.



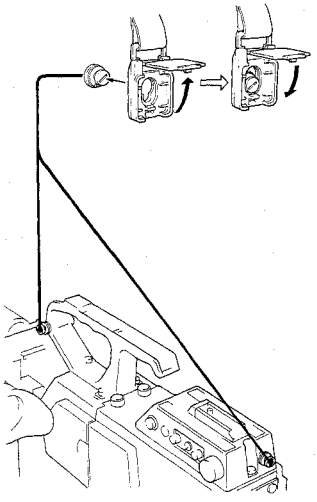
2.



to detach the cable

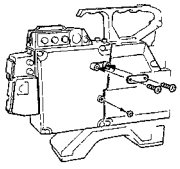


2-7-3. Attaching the supplied shoulder strap

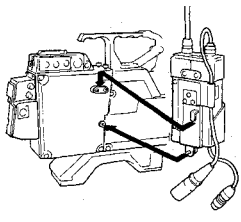


2-7-4. Attaching a WRR-28L wireless receiver

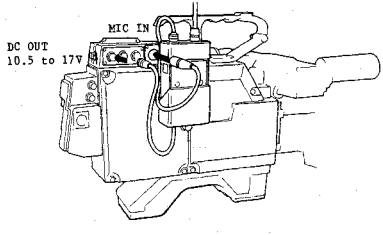
1. Attach the Bracket by using the two supplied M3 screws.



2. Attach a WRR-28L wireless receiver.



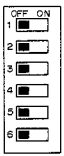
3. Connect to DC OUT terminal and MIC IN terminal.



2-8. Switches and Controls Setting on the Board

IF-227 board

S1 Switch



NTSC/PAL SELECT
BAUD RATE Switch
BAUD RATE Switch
GAIN Switch
GAIN Switch
NORMAL/EXTEND

S1-1 (NTSC/PAL) Switch

Used for selecting the NTSC system or PAL system.

S1-2 (BAUD RATE) Switch

S1-3 (BAUD RATE) Switch

Used for selecting the data transfer speed.

S1-2	S1-3	BAUD RATE
OFF	OFF	2400
OFF	ON	1200
ON	OFF	600
ON	ON	600

S1-4 (GAIN) Switch

S1-5 (GAIN) Switch

Used for matching the gain of the camera and the MASTER GAIN of the camera control unit CCU-355/355P.

Normally set to "0/9/18 dB".

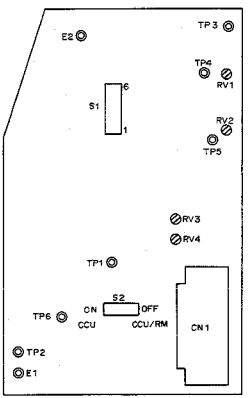
S1-4	S1-5	MASTER GAIN
OFF	OFF	0/6/12 (18) dB
OFF	ON	0/9/18 dB
ON	OFF	0/9/24 dB
ON	ON	RM-3601

S1-6 (NORMAL/EXTEND) Switch

When attaching the gamma control board kit BKP-501 in the camera BVP-50/50P, set to "EXTEND position".

The camera BVP-7/7P is factory-set the gamma control board kit BKP-501.

This switch is factory-set to the "EXTEND position".



IF-227 BOARD (COMPONENT SIDE)

TR-47 board

S1: MIC SELECT Switch

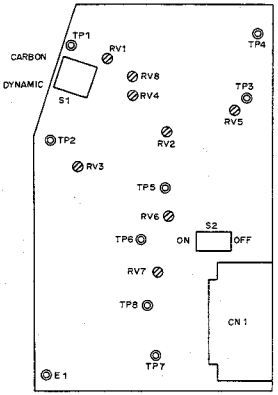
This is the switch for selecting the input impedance and gain of the intercom amplifier. Both carbon-type and dynamic-type microphones can be used for intercommunication.
Normally set to "CARBON".

S2: PGM/INCOM MIX ON/OFF Switch

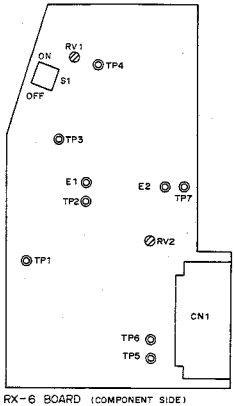
RX-6 board

S1: MIC POWER ON/OFF Switch

When turning on the S1 switch, the dc voltage (+48V) is supplied from the MIC IN connector.
Normally set to "OFF".



TR-47 BOARD (COMPONENT SIDE)



RX-6 BOARD (COMPONENT SIDE)

VA-80 board

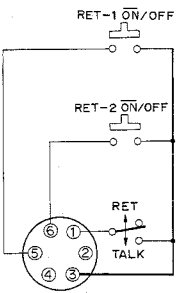
S1: TALK/RET SELECT Switch

When the return video 2 signal is switched on and off with the VTR START/STOP button located on the camera or on the lens, set to "RET". When the cameraman's voice is transmitted to the CCU, set to "TALK".

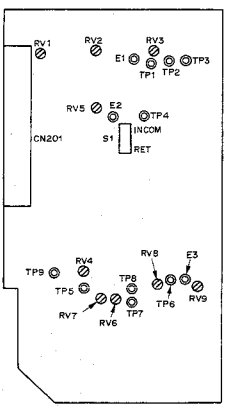
TALK SWITCH	S1	FUNCTION
ON	TALK	The cameraman's voice is transmitted to the CCU.
	RET	
REMOTE	TALK	Transmission of the cameraman's voice to the CCU is controlled by the VTR START/STOP button located on the camera or on the lens.
	RET	The return video 2 signal is switched on and off with the VTR START/STOP button located on the camera or on the lens. But, the cameraman's voice is not transmitted.

This switch is factory-set to the "TALK position".

When connecting the circuit diagram as shown below to the RET CONT connector located on the CA-55/55P, the return video 2 signal can be switched on and off and the intercom microphone can be turned on/off.

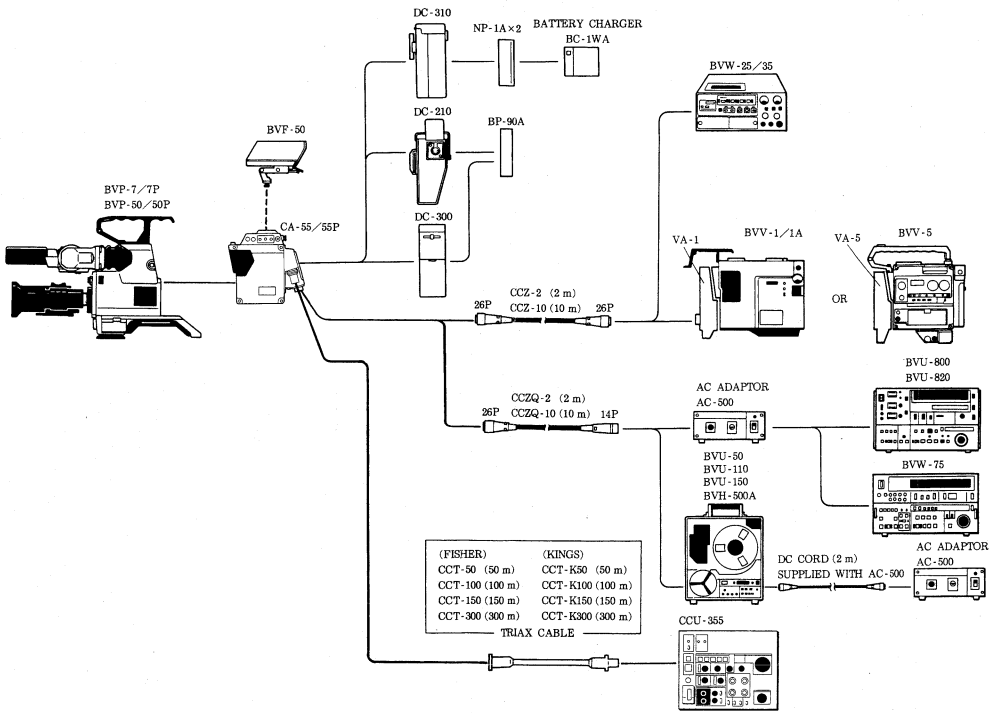


(WIRING SIDE)



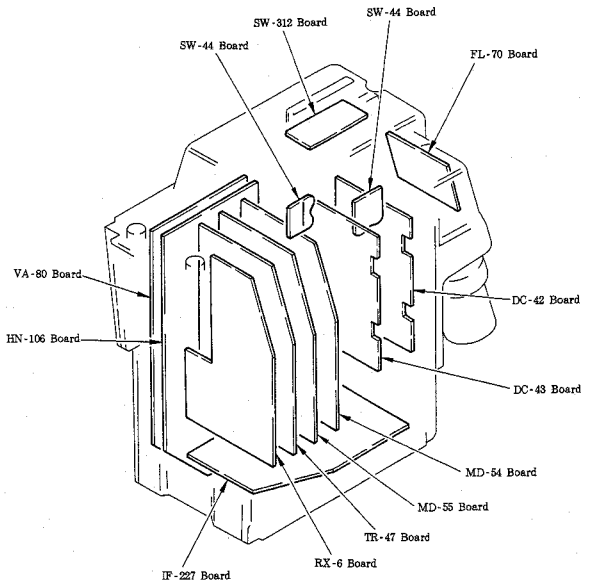
VA-80 BOARD (COMPONENT SIDE)

2-9. SYSTEM CONFIGURATION



SECTION 3
SERVICE INFORMATION

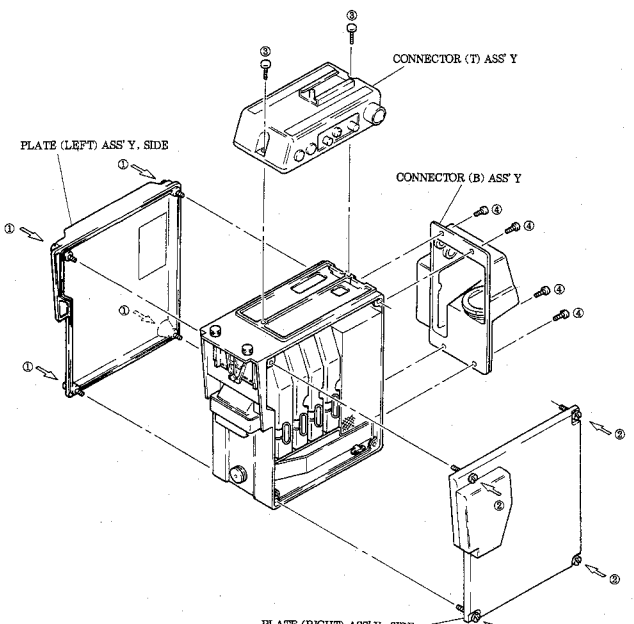
3-1. BOARD LAYOUT



3-2. REPLACEMENT OF MAIN PARTS

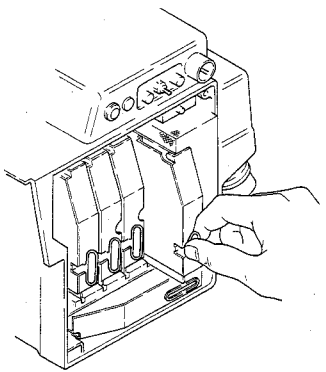
3-2-1. Removal of Cabinet

1. Loosen the four screws ① (Screw (M4x18), lid) which fixes the plate (left) Ass'y side, and remove it.
2. Loosen the four screws ② (Screw (M4x18), lid) which fixes the plate (right) Ass'y side, and remove it.
3. Remove the two screws ③ (+B5x8) which fixes the connector (T) Ass'y, and remove it.
4. Remove the two screws ④ (+B4x8) which fixes the connector (B) Ass'y, and remove it.



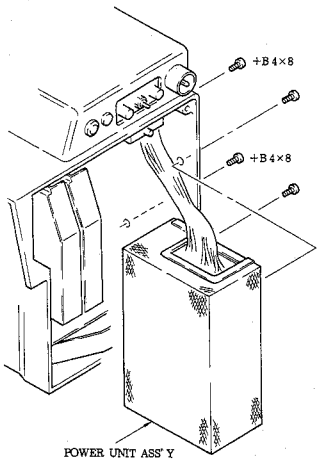
3-2-2. To Extract the Boards

Pull the pull lever attached to each board toward you.

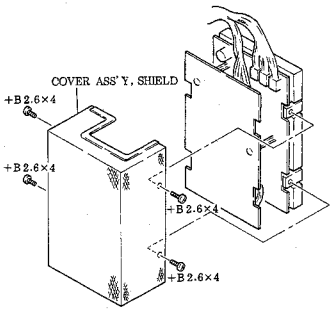


3-2-3. Replacement of DC-42 and DC-43 Boards

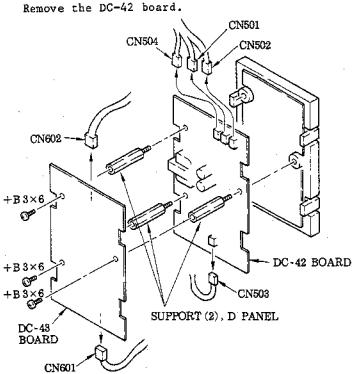
1. Remove the PLATE (RIGHT) Ass'y SIDE and CONNECTOR (B) Ass'y, referring to 3-2-1. "Removal of Cabinet".
2. Remove the MD Board, referring to 3-2-2. "To Extract the Boards"
3. Remove the four screws (+B4x8) and remove the power unit Ass'y.



4. Remove the four screws (+B2.6x4) shown in figure and remove the Cover Ass'y shield.



5. Remove the three screws (+B3x6) and disconnect the two connectors CN601, CN602 on the DC-43 board. Remove the DC-43 board. Remove the three Supports (2), D panel and disconnect the four connectors CN501, CN502, CN503 and CN504 on the DC-42 board. Remove the DC-42 board.



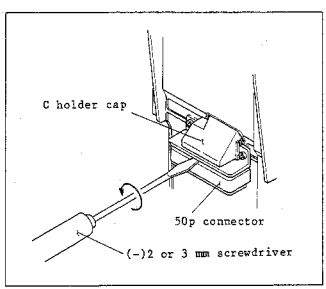
6. Install the new DC-42/43 Boards by reversing procedures above.

3-3. SERVICING PRECAUTION

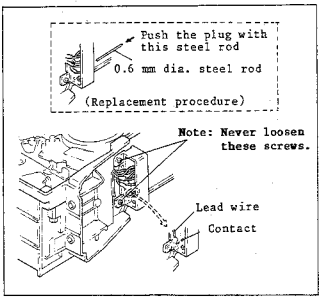
3-3-1. Precautions on Replacement of CAMERA connector (50P connector)

The CAMERA connector (50 pin connector) is attached using a high-precision special tool (CV positioning) so as to keep the accurate positioning relation with camera mount (C shoe) and to dock with any of BVP-50/7 series. Avoid to loosen or remove the screws for 50P connector, C shoe, and stopper.
Therefore, the V connector holder and 50-pin camera connector should not be removed except when especially specified.

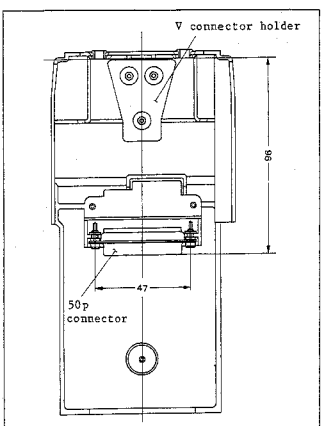
. For check of the 50-pin connector block, remove the C holder cap as shown in the figure below.



. When a lead wire in the 50-pin connector block is being cut off at the connector block, solder the lead wire onto a contact.
. For defective contact connection, remove the contact for replacement, as shown in the figure below.

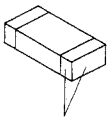


. When the 50-pin connector and V connector holder are removed, be sure to attach them to the position to meet the dimensions described below, by using a scale. Connect with your camera after attached, and then confirm that the connection is securely preformed.



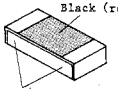
3-3-2. Precaution on Replacement of Chip Parts

Capacitor



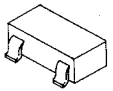
Covered with electrode.

Resistor



Not covered with electrode.

Diode and Transistor



Tools required:

Soldering iron of approx. 20W
(Use a temperature controller, if possible, which can control the iron temperature to 270±10°C.)
Braided wire (SOLDER TAUL)
Solder (A solder of 0.6mm in diameter is recommended.)
Tweezeres

Soldering conditions:

Iron temperature of 270±10°C
A connector should be soldered within 2 seconds.

The chip parts removed shoud not be used again.

For details, refer to CHIP COMPONENTS MANUAL, Sony's parts No. 9-972-289-91 prepared by Sony Corporation.

Procedures

1. To remove a resistor or capacitor, place the trip of a soldering iron on chip parts to heat the parts, and then move it horizontally for removal while being desoldered. For removal of a diode or transistor, heat the one side, with two pins, of chip parts at the same time, set the parts up when desoldered, and remove the two pins. And then, remove the pin on another side.
2. Absorb solder by using a braided wire to smooth the land surface of board after removal.
3. Confirm by visual check that no trace of the removed chip parts is peeled off and no adjacent parts is damaged or bridged.
4. Perform a thin pretinning on the trace.
5. Place new chip parts on the trace to solder its both sides.

3-3-3. PROM IC

IC17 on the IF-227 board is PROM IC.
This PROM IC has a suffix to its original designation as follows.

IC 17	MBM27C64-CA-55-1.00

Never use an IC having no suffix to its original designation. (Its memory has not been programmed)

3-3-4. Precaution on Replacement Parts

1. **Safety Related on Components Warning**
   Components identified by shading marked with ⚠ on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony parts whose parts numbers appear as shown in this manual or in service manual supplements published by Sony.
2. **Standardization of Parts**
   Replacement Parts supplied from Sony Parts Center will sometimes have different shape and outside view from the parts which actually in use. This is due to "accomodating the improved parts and/or engineering change" or "standardization of genuine parts". This manual's exploded view and electrical spare parts list are indicating the part numbers of "the standardized genuine parts at present".
3. **Stocked of Parts**
   The parts marked with "S" in the SP column of the exploded views and electrical spare parts list are normally required for routine service work. Orders for parts, marked with "O" will be processed, but allow for additional delivery time.
4. **Units of Capacitors, Inductors, and Resistors**
   The following units are omitted in the schematic diagrams, exploded views, and electrical parts list unless otherwise specified;
   Capacitor ; μF
   Inductor ; μH
   Resistor ; Ω

3-4. TOOLS AND JIGS

Parts No.	Description
A-7513-880-A	Extension board "EX-190" (supplied accessory)

SECTION 4
ALIGNMENT

4-1. PREPARATION

4-1-1. Equipment required

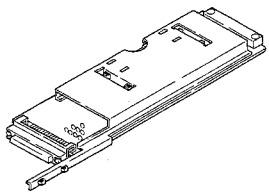
- Measuring instruments
  - Digital voltmeter
  - Frequency counter
  - Oscilloscope of more than 300MHz
  - Low frequency oscillator

- Peripheral equipments
  - Color video camera BVP-7/7P
  - Camera control unit CCU-355/P
  - Camera adaptor CMA-8
  - Triaxial cable CCT/CCT-K cable

- Jigs

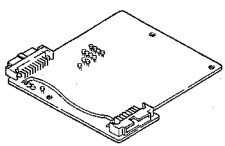
A-751-864-A	Extension Board EX-189

Supplied accessory for CCU-355/355P



A-751-880-A	Extension Board EX-190

Supplied accessory for CA-55/55P

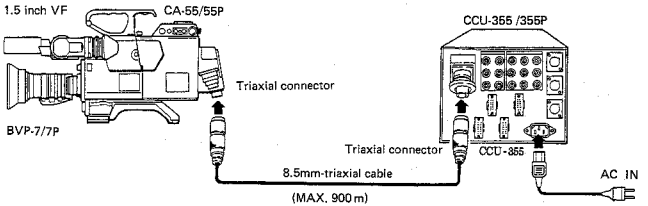


4-1-2. Notes on Adjustments

- When a board is extracted, set POWER switch to OFF.

- Before beginning adjustment, warm up for 10 minutes.

4-1-3. Connection



4-1-4. Initial Settings

- CA-55/55P
  POWER switch → CCU ON
  S1 (R) /MD-54 board → ON
  S2 (G) /MD-54 board → ON
  S3 (B) /MD-54 board → ON

- BVP-7/7P
  CAMERA/VTR switch → ON/STBY

- CCU-355/355P
  MAIN POWER switch → ON
  CAMERA POWER switch → ON
  S1 (TRIAX TEST) /AT-26 board → ON
  OUTPUT selector → CAM

4-2. ALIGNMENT PROCEDURE

Step 1. Power Supply System Adjustment

1-1. +9.5V Adjustment
1-2. +9V Adjustment

Step 2. IF-227 Board Adjustment

2-1. H BLKG PHASE Adjustment
2-2. H BLKG WIDTH Adjustment
2-3. V BLKG WIDTH Adjustment

Step 3. VA-80 Board Adjustment

Preparation
3-1. SAMPLE Pulse (1) Adjustment
3-2. SAMPLE Pulse (2) Adjustment
3-3. SAMPLE Pulse (3) Adjustment
3-4. Y Gain Adjustment
3-5. R-Y Gain Adjustment
3-6. B-Y Gain Adjustment
3-7. Battery Alarm Set Adjustment
3-8. RET Video Gain Adjustment

Step 4. MD-54 Board Adjustment

4-1. R.G.B Level Adjustment
4-2. Carrier Level Adjustment
4-3. SAMPLE Level Adjustment
4-4. SYNC Level Adjustment
4-5. RF Level Adjustment

Step 5. MD-55 Board Adjustment

5-1. 36MHz Adjustment (1)
5-2. 36MHz Adjustment (2)
5-3. 18MHz Adjustment
5-4. SYNC Level Adjustment
5-5. SAMPLE Level Adjustment
5-6. CHROMA RF Adjustment (1)
5-7. CHROMA RF Adjustment (2)

Step 6. TR-47 Board Adjustment

6-1. Carrier Frequency Adjustment
6-2. RF Level Adjustment
6-3. Tuning Adjustment
6-4. H CONT Level Adjustment
6-5. MIC Level Adjustment
6-6. CHU INCOM Level Adjustment
6-7. CCU INCOM Demodulation Level Adjustment
6-8. PGM Demodulation Level Adjustment

Step .7 RX-6 Board Adjustment

7-1. PLL Free Run Frequency Adjustment
7-2. Return Video Level Adjustment

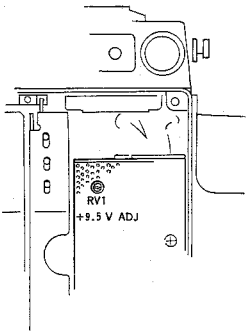
STEP 1. POWER SUPPLY SYSTEM ADJUSTMENT

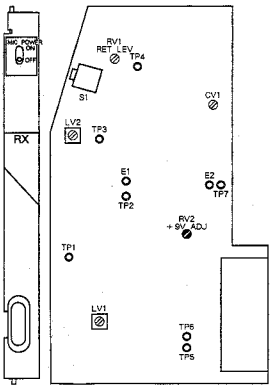
1-1. +9.5V Adjustment

To be extended: RX-6
Equipment: Digital voltmeter
Test point: B4/Extension board
Adj. point: ⊘RV1/DC-43 board
Specification: 9.5±0.1V

1-2. +9V Adjustment

To be extended : RX-6
Equipment : Digital voltmeter
Test point : TP5
Adj. point : ⊘RV2 (+9V ADJ)
Specification : 9.0 ± 0.01V



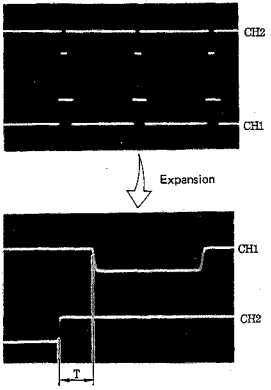


RX-6 board (Component side)

STEP 2. IF-227 BOARD ADJUSTMENT

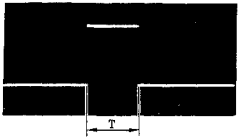
2-1. H BLKG PHASE Adjustment

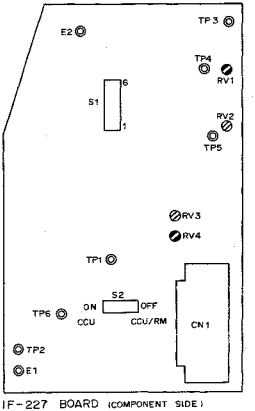
To be extended: IF-227
Equipment: Oscilloscope
Test point: CH1 B8/Extension board
CH2 B11/Extension board
Adj. point: ⊘RV1 (H BLKG PHASE)
Specification: T=1.4±0.1 [μS] (NTSC)
T=1.65 ± 0.2 [μS] (PAL)



2-2. H BLKG WIDTH Adjustment

To be extended: IF-227
Equipment: Oscilloscope
Test point: B8/Extension board
Adj. point: ⊘RV4 (H BLKG WIDTH)
Specification: T=10.9 ± 0.2 [μS] (NTSC)
T=12.0 ± 0.2 [μS] (PAL)

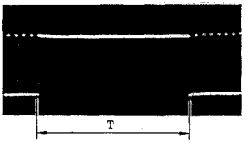


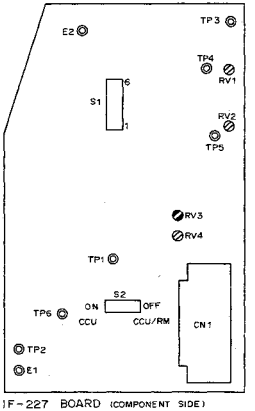


IF-227 BOARD (COMPONENT SIDE)

2-3. V BLKG WIDTH Adjustment

To be extended: IF-227
Equipment: Oscilloscope
Test point: B8/Extension board
Trigger: A5/Extension board
Adj. point: ⊘RV3 (V BLKG WIDTH)
Specification: T=20H, 1270 [μS] (NTSC)
T=25H, 1600 [μS] (PAL)



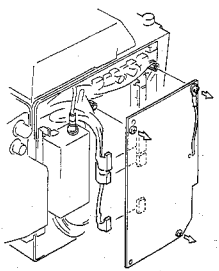


IF-227 BOARD (COMPONENT SIDE)

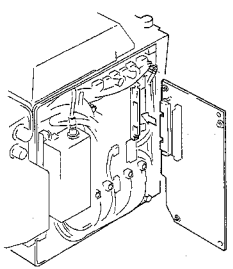
STEP 3. VA-80 BOARD ADJUSTMENT

Preparation

1. Remove the three screws securing the VA-80 boad. Disconnect the three connectors, CN203, CN204 and CN205 on the VA-80 board.

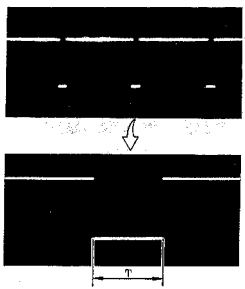


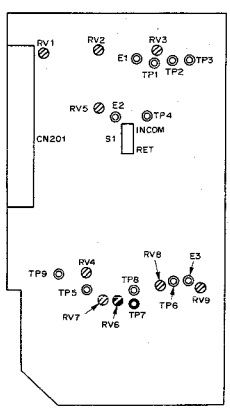
2. Connect the CN201 on the VA-80 board to the CN106 on the HN-106 board to adjust the VA-80 board.



3-1. SAMPLE PULSE (1) Adjustment

Equipment: Oscilloscope
Test point: TP7
Adj. point: ⊘RV6 (H PHASE)
Specification: T = 6.0 ± 0.2 [μS]

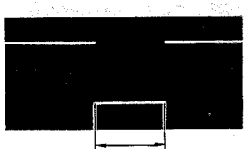


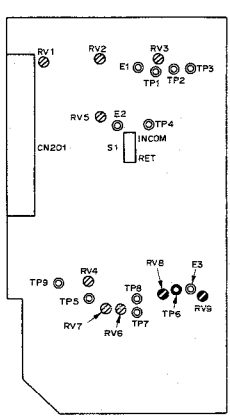


VA-80 BOARD (COMPONENT SIDE)

3-2. SAMPLE PULSE (2) Adjustment

Equipment: Oscilloscope
Test point: TP9
Adj. point: ⊘RV7 (H WIDTH)
Specification: 11.0±0.5 [μS]



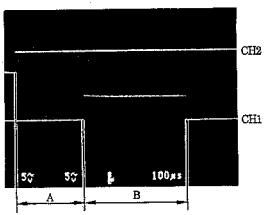


VA-80 BOARD (COMPONENT SIDE)

3-3. SAMPLE PULSE (3) Adjustment

To be extended: IF-227
Equipment: Oscilloscope
Test point: TP6
Adj. point: ⊘RV8 (SAMPLE PULSE PHASE)
⊘RV9 (SAMPLE PULSE WIDTH)

Procedure:
1. Apply the probe for CH1 of the oscilloscope to the test point A5 on the extension board and the probe for CH2 to TP6 on the VA-80 board.
2. Adjust ⊘RV8 so that the waveform A at CH1 is 286±10 μS.
3. Adjust ⊘RV9 so that the waveform B at CH1 is 440±10 μS.



3-4. Y GAIN Adjustment

Preparation

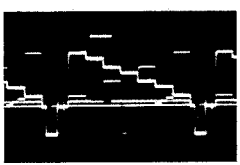
1. Turn off the POWER SW on the CCU and disconnect the triaxial cable.
2. Connect the DC IN connector on the CA-55 to the CMA-8 using a cable. Set the POWER SW on the CA-55 to "EXT".

Equipment: Oscilloscope
Test point: TP1
Adj. point: ⊘RV1 (Y GAIN)

Procedure:

1. Solder a TP terminal on the soldering side at pin 3 of CN202. Measure the voltage at the TP terminal using an oscilloscope to get an input amplitude.
2. Measure the voltage at TP1 using the oscilloscope to get an output amplitude. Adjust ⊘RV1 so that the following spcification is satisfied.

specification: $\frac{\text{output amplitude}}{\text{input amplitude}} = 2.0 \pm 0.01\ \%$



3-5. R-Y GAIN Adjustment

Preparation

1. Turn off the POWER SW on the CCU and disconnect the triaxial cable.
2. Connect the DC IN connector on the CA-55 to the CMA-8 using a cable. Set the POWER SW on the CA-55 to "EXT".

Equipment: Oscilloscope
Test point: TP2
Adj. point: ⊘RV2 (R-Y GAIN)

Procedure:

1. Solder a TP terminal on the soldering side at pin 4 of CN202. Measure the voltage at the TP terminal using an oscilloscope to get an input amplitude.
2. Measure the voltage at TP2 using the oscilloscope to get an output amplitude. Adjust ⊘RV2 so that the following spcification is satisfied.

specification: $\frac{\text{output amplitude}}{\text{input amplitude}} = 2.0 \pm 0.01\ \%$

3-6. B-Y GAIN Adjustment

Preparation

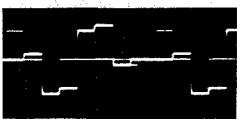
1. Turn off the POWER SW on the CCU and disconnect the triaxial cable.
2. Connect the DC IN connector on the CA-55 to the CMA-8 using a cable. Set the POWER SW on the CA-55 to "EXT".

Equipment: Oscilloscope
Test point: TP3
Adj. point: ⊘RV3 (B-Y GAIN)

Procedure:

1. Solder a TP terminal on the soldering side at pin 5 of CN202. Measure the voltage at the TP terminal using the oscilloscope to get an input amplitude.
2. Measure the voltage at TP3 using the oscilloscope to get an output amplitude. Adjust ⊘RV3 so that the following spcification is satisfied.

specification: $\frac{\text{output amplitude}}{\text{input amplitude}} = 2.0 \pm 0.01\ \%$



3-7. BATTERY ALARM SET Adjustment

This adjustment is complicated and severe, and it is strictly performed at the factory, so, do not turn the control in this adjustment unless something is wrong with the circuit.

Preparation

POWER SW → EXT
Solder TP terminals on the soldering side at pins 17 and 18 of CN201.

Equipment: Voltage Selector
Digital voltmeter
Oscilloscope
Test point: CN201-18 pin (GND : E1)
Adj. point: ⊘RV4 (BATT ALARM SET)

Procedure:

1. Turn ⊘RV4 fully clockwise.
2. Connect the digital voltmeter to the EXT DC connector on the CA and supply 11.2V to the CA. Confirm the voltage between pin 17 of CN201 and GND is 11.2V.
3. Apply the probe to pin 18 of CN201 (GND: E1). Turn ⊘RV4 counterclockwise slowly and stop it at the point where the DC voltage starts to flutter between GND (LOW) and 11.2V (HIGH).

3-8. RET VIDEO GAIN Adjustment

Preparation

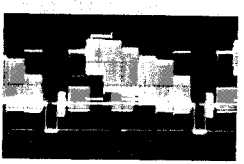
- Connect between RET1 and RET2 connectors with BNC cable.
- Terminate the other RET2 connector by 75 ohms.

Equipment: Oscilloscope
Test point: TP4
Adj. point: ⊘RV5 (RET VIDEO GAIN)

Procedure:

1. Solder a TP terminal on the soldering side at pin 35 of CN202. Measure the voltage at the TP terminal using the oscilloscope to get an input amplitude.
2. Measure the voltage at TP4 using the oscilloscope to get an output amplitude. Adjust ⊘RV5 so that the following specification is satisfied.

specification: $\frac{\text{output amplitude}}{\text{input amplitude}} = 2.0 \pm 0.01\ \%$



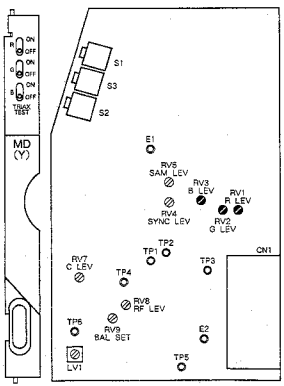
STEP 4. MD-54 BOARD ADJUSTMENT

4-1. R.G.B Level Adjustment

To be extended : MD-54
Equipment : Oscilloscope
Test point : TP1 (R), TP2 (G), TP3 (B)
GND : E1
Adj. point : ⊘RV1 (R LEV)
⊘RV2 (G LEV)
⊘RV3 (B LEV)

Procedure :

1. Adjust ⊘RV2 so that the G-ch waveform level at TP2 is 700 ± 5mV.
2. Adjust ⊘RV1 so that the R-ch waveform level at TP1 is within ± 5mV of G-ch level measured in Procedure 1.
3. Adjust ⊘RV3 so that the B-ch waveform level at TP3 is within ± 5mV of G-ch level measured in Procedure 1.



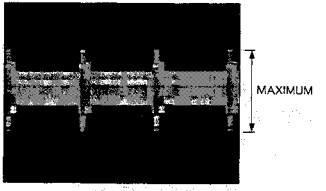
MD-54 board (Component side)

4-2. Carrier Level Adjustment

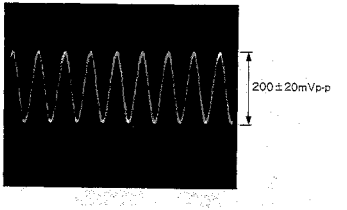
To be extended : MD-54
Equipment : Oscilloscope
Test point : TP5 (GND : E2)
TP6 (GND : E2)
Adj. point : ◐LV1
◐RV7 (C LEV)

Procedure :

1. Adjust ◐LV1 so that the level at TP5 is maximum.



2. Adjust ◐RV7 so that the level at TP6 is 200 ± 20mVp-p.

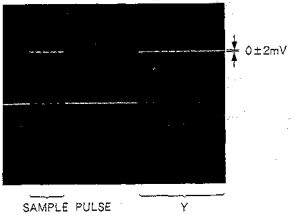


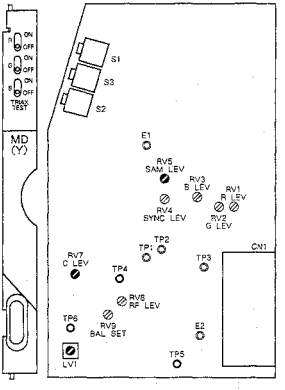
4-3. SAMPLE Level Adjustment

To be extended : MD-54
Equipment : Oscilloscope
Test point : TP4
Adj. point : ◐RV5 (SAM LEV)

Procedure :

1. Adjust ◐RV5 so that the difference between the sample pulse level and Y level is 0 ± 2mV.

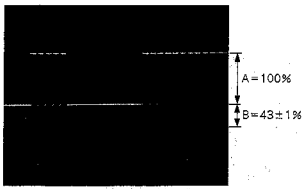


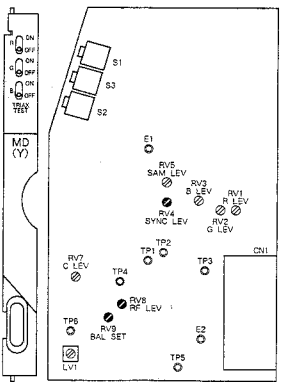


MD-54 board (Component side)

4-4. SYNC Level Adjustment

To be extended : MD-54
Equipment : Oscilloscope
Test point : TP4
Adj. point : ◐RV4 (SYNC LEV)
Specification : B = 43 ± 1%





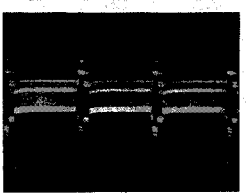
MD-54 board (Component side)

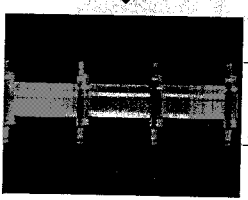
4-5. RF Level Adjustment

Preparation :
- Extract the DM-67 board of CCU-355 using the extension board (EX-189).
- Connect the CCU-355 to the CA-3511 with a Triaxial cable of less than 1 meter.

To be extended : MD-54
Equipment : Oscilloscope
Test point : TP10 (GND : TP11) ／CCU-355 Extension board
Adj. point : ◐RV8 (RF LEV)
◐RV9 (BAL SET)

Procedure :
1. Adjust ◐RV9 so that the waveform at TP10 is flat.





2. Adjust ◐RV8 so that the level at TP10 is 1.0 ± 0.02Vp-p.

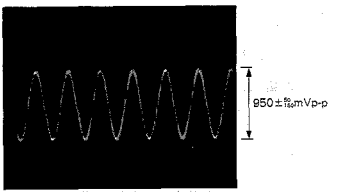
STEP 5. MD-55 BOARD ADJUSTMENT

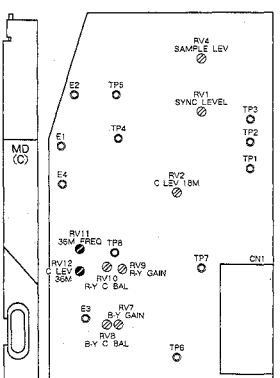
5-1. 36MHz Adjustment (I)

To be extended : MD-55
Equipment : Frequency counter
Test point : TP8
Adj. point : ⊘RV11 (36M FREQ)
Specification : 36MHz ± 10Hz

5-2. 36MHz Adjustment (II)

To be extended : MD-55
Equipment : Oscilloscope
Test point : TP8
Adj. point : ⊘RV12 (C LEV 36M)
Specification : 950 $\pm^{50}_{150}$ mVp-p

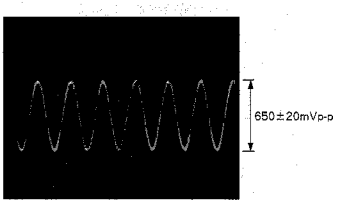




MD-55 board (Component side)

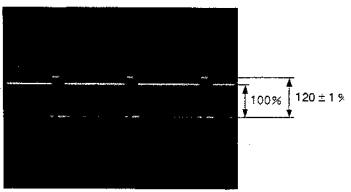
5-3. 18MHz Adjustment

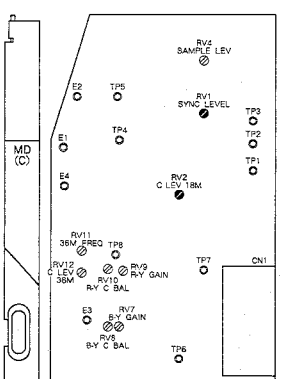
To be extended : MD-55
Equipment : Oscilloscope
Test point : TP7 (GND : E4)
Adj. point : ⊘RV2 (C LEV 18M)
Specification : 650 ± 20mVp-p



5-4. SYNC Level Adjustment

Preparation : S2 (G), S3 (B) ／MD-55→OFF
To be extended : MD-55
Equipment : Oscilloscope
Test point : TP4 (GND : E1)
Adj. point : ⊘RV1 (SYNC LEVEL)
Specification : 120 ± 1%

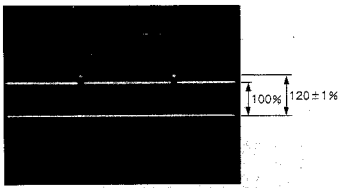


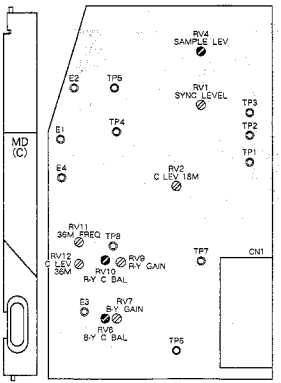


MD-55 board (Component side)

5-5. SAMPLE Level Adjustment

Preparation : S1 (R), S2 (G) /MD-55→OFF
To be extended : MD-55
Equipment : Oscilloscope
Test point : TP5
Adj. point : ◐RV4 (SAMPLE LEV)
Specification : 120 ± 1 %





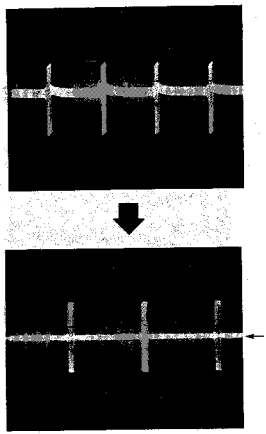
MD-55 board (Component side)

5-6. CHROMA RF Adjustment (I)

To be extended : MD-55
Equipment : Oscilloscope
Test point : TP6 (GND : E3)
Adj. point : ◐RV8 (B-Y C BAL)
◐RV10 (R-Y C BAL)

Procedure :

1. Adjust ◐RV10 so that the waveform at TP6 is flat.



2. Adjust ◐RV8 so that the amplitude portion "A" of the waveform is minimized.

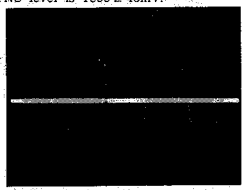
5-7. CHROMA RF Adjustment (II)

Preparation : S1 (R), S2 (G), S3 (B) / MD-54→OFF
- Extract the DM-67 board of CCU-355 using the extension board (EX-189).
- Connect the CCU-355 to the CA-3511 with a triaxial cable of less than 1 meter.

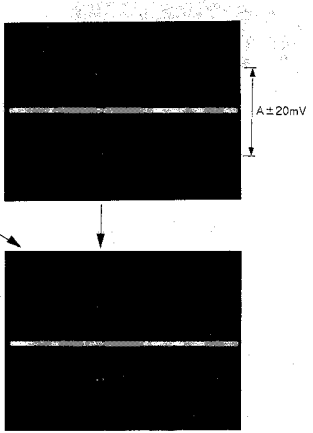
To be extended : MD-55
Equipment : Oscilloscope
Test point : TP50 (GND : TP49) / DM-67
Adj. point : ◐RV9 (R-Y GAIN)
◐RV7 (B-Y GAIN)

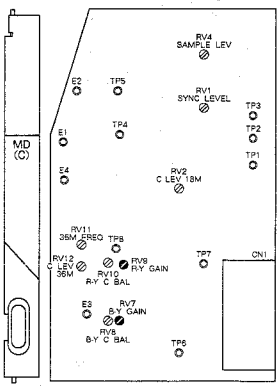
Procedure :

1. Adjust ◐RV9 so that the amplitude portion "A" of the SYNC level is 1600 ± 40mV.



2. Adjust ◐RV7 so that the SAMPLE level is A ± 20mV.





MD-55 board (Component side)

STEP 6. TR-47 BOARD ADJUSTMENT

6-1. Carrier Frequency Adjustment

Preparation : MIC switch/side panel→ON

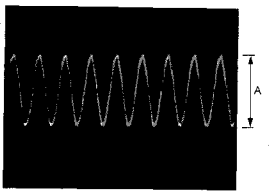
To be extended : TR-47
Equipment : Frequency counter

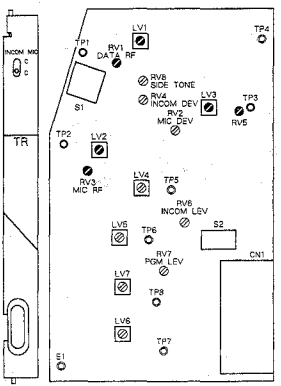
Test Point	Adj. Point	Specification
TP1	LV1 (6.2M ADJ)	6.2 ± 0.003MHz
TP2	LV2 (6.8M ADJ)	6.8 ± 0.003MHz
TP3	LV3 (5.7M ADJ)	5.7 ± 0.003MHz

6-2. RF Level Adjustment

To be extended : TR-47
Equipment : Oscilloscope

Test Point	Adj. Point	Specification
TP1	RV1 (DATA RF)	250 ± 10mV
TP2	RV3 (MIC RF)	250 ± 10mV
TP3	RV5 (INCOM RF)	300 ± 10mV



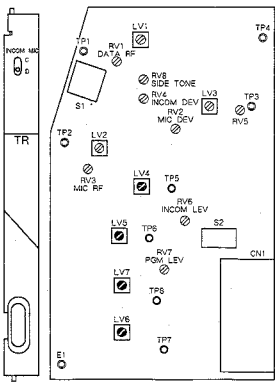


TR-47 board (Component side)

6-3. TUNING Adjustment

To be extended : TR-47
Equipment : Digital voltmeter

Test Point	Adj. Point	Specification
TP5	⊘LV4 (4.5M TUNE)	4.4 ± 0.1V
TP6	⊘LV5 (4.9M TUNE)	4.4 ± 0.1V
TP7	⊘LV6 (3.6M TUNE)	5.0 ± 0.1V

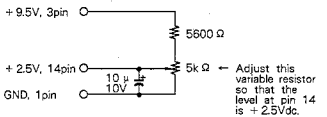


TR-47 board (Component side)

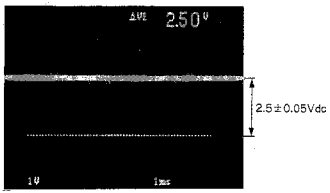
6-4. H CONT Level Adjustment

Note :
- Unless the variable inductor LV7 is replaced, do not perform this adjustment. Because it is very severe.
- When adjustment is to be performed, connect a completely adjusted camera control unit CCU-355 to the camera.

Preparation :
- Extract the SG-131 board from the CCU-355.
- Make a jig shown below and connect it to pins 1, 3 and 14 for the TR-46 board of CCU-355. 2.5Vdc will be supplied between pin 14 and GND.



To be extended : TR-47
Equipment : Oscilloscope
Test point : TP8
Adj. point : ⊘LV7 (3.9M TUNE)
Specification : 2.5 ± 0.05Vdc

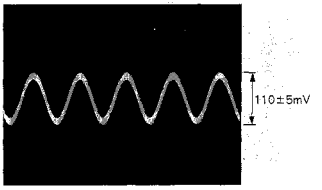


6-5. MIC Level Adjustment

Note :
When adjustment is to be performed, connect a completely adjusted camera control unit CCU-355 to the camera.

Preparation :
- MIC connector → Open
- Supply the 1kHz, – 60dBs sine wave from the low frequency oscillator to B19, B20/extension board.

To be extended :	TR-47, TR-46 (CCU-355)
Equipment :	Low frequency oscillator Oscilloscope
Test point :	33 pin/TR-46 (CCU-355)
Adj. point :	◐RV2 (MIC DEV)
Specification :	110 ± 5mV

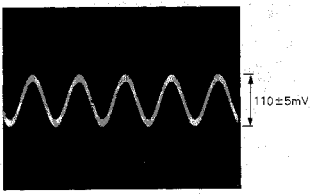


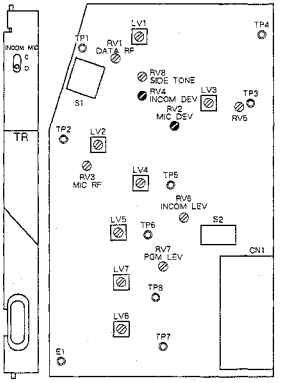
6-6. CHU INCOM Level Adjustment

Note :
When adjustment is to be performed, connect a completely adjusted camera control unit CCU-355 to the camera.

Preparation :
- INCOM connector → Open
- Supply the 1kHz, – 20dBs sine wave from the low frequency oscillator to A12, A13/extension board.

To be extended :	TR-47, TR-46 (CCU-355)
Equipment :	Low frequency oscillator Oscilloscope
Test point :	37 pin/TR-46 (CCU-355)
Adj. point :	◐RV4 (INCOM DEV)
Specification :	110 ± 5mV





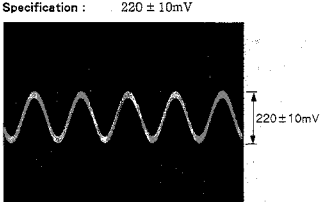
TR-47 board (Component side)

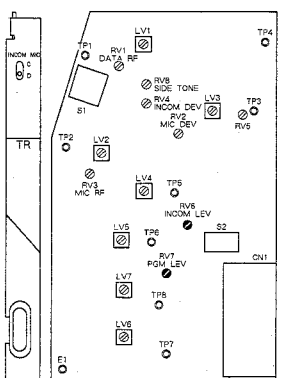
6-7. CCU INCOM Demodulation Level Adjustment

Note :
When adjustment is to be performed, connect a completely adjusted camera control unit CCU-355 to the camera.

Preparation :
Supply the 1kHz, 0dBs sine wave from the low frequency oscillator to INCOM connector of CCU-355 rear panel.

To be extended : TR-47
Equipment : Low frequency oscillator
Test point : B14/extension board
Adj. point : RV6 (INCOM LEVEL)
Specification : 220 ± 10mV





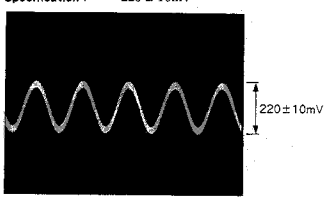
TR-47 board (Component side)

6-8. PGM Demodulation Level Adjustment

Note :
When adjustment is to be performed, connect a completely adjusted camera control unit CCU-355 to the camera.

Preparation :
Supply the 1kHz, 0dBs sine wave from the low frequency oscillator to PGM connector of CCU-355 rear panel.

To be extended : TR-47
Equipment : Low frequency oscillator
Oscilloscope
Test point : B11/extension board
Adj. point : RV7 (PGM LEVEL)
Specification : 220 ± 10mV



7-1. PLL Free Run Frequency Adjustment

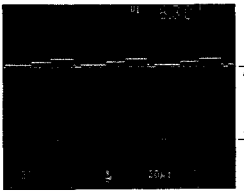
Preparation :

- Connect a test signal generator to the RET 1 connector on the rear panel of the CCU-355 with a BNC cable.

To be extended : RX-6
Equipment : Oscilloscope
Test signal generator
Test point : TP8
Adj. point : ⊘LV2 (PLL SET)

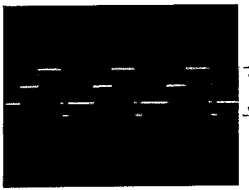
Procedures :

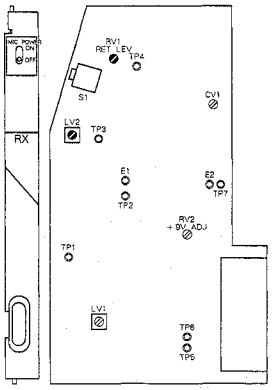
1. Set each mode for the test signal generator as follows.
   - 3 STEP
   - LINEARITY
   - APL 50%
   - STD
   - B/W
2. Adjust ⊘LV2 so that the DC voltage of waveform is 6.3 ± 0.1Vdc.



7-2. Return Video Level Adjustment

To be extended : RX-6
Equipment : Oscilloscope
Test signal generator
Test point : TP7
Adj. point : ⊘RV1 (RET LEVEL)
Specification : 1.00 ± 0.05V



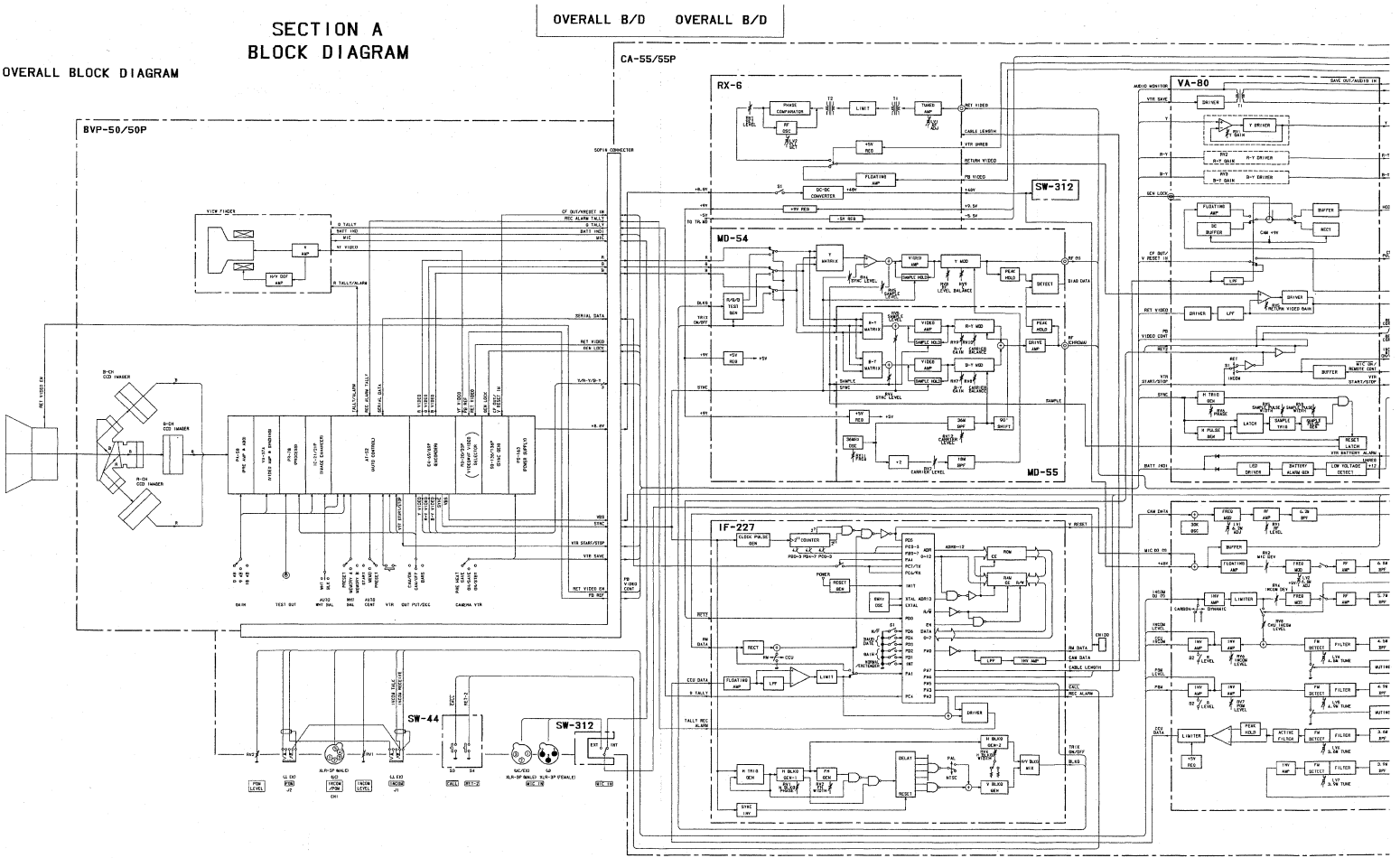


RX-6 board (Component side)

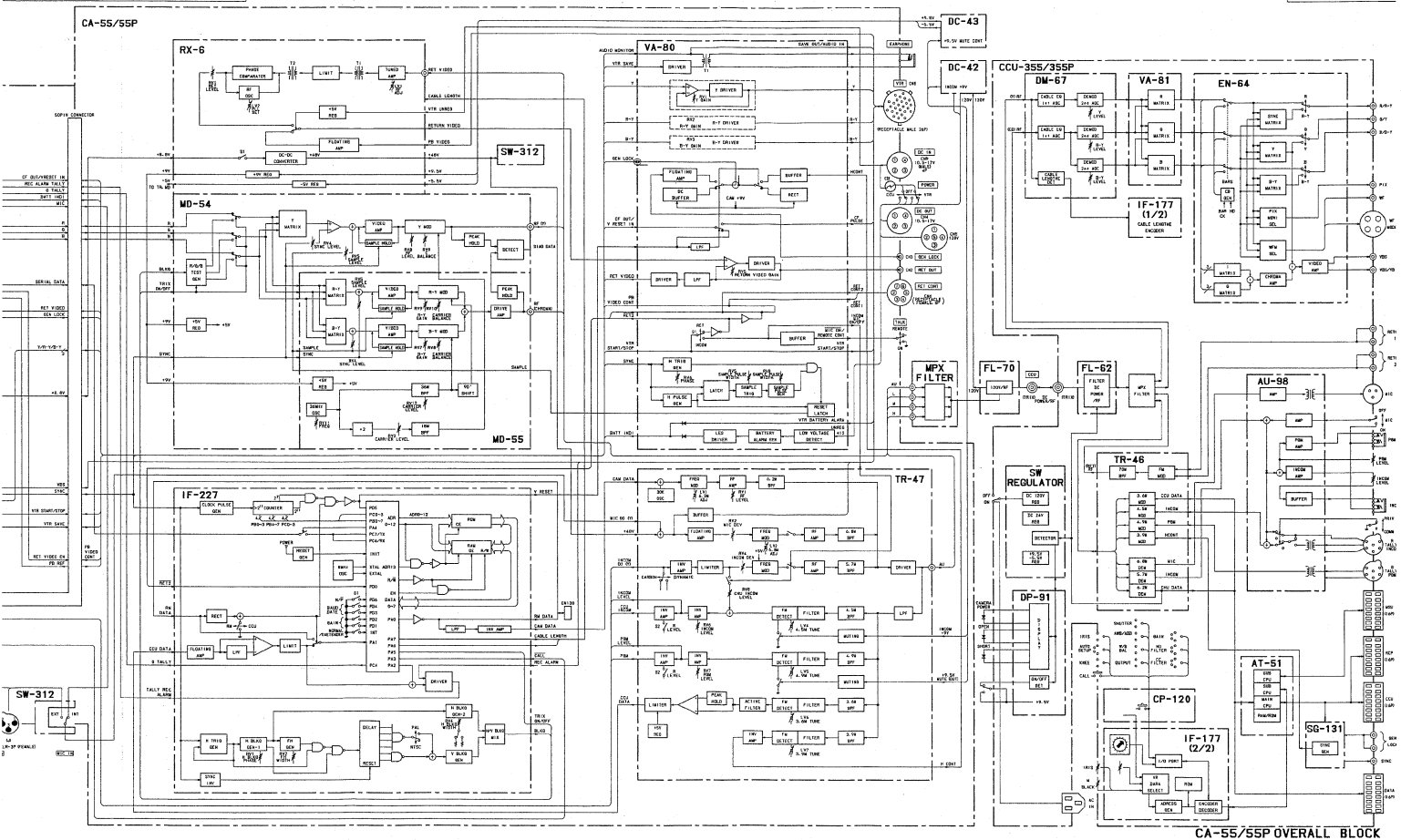
SECTION A
BLOCK DIAGRAM

OVERALL BLOCK DIAGRAM

OVERALL B/D OVERALL B/D

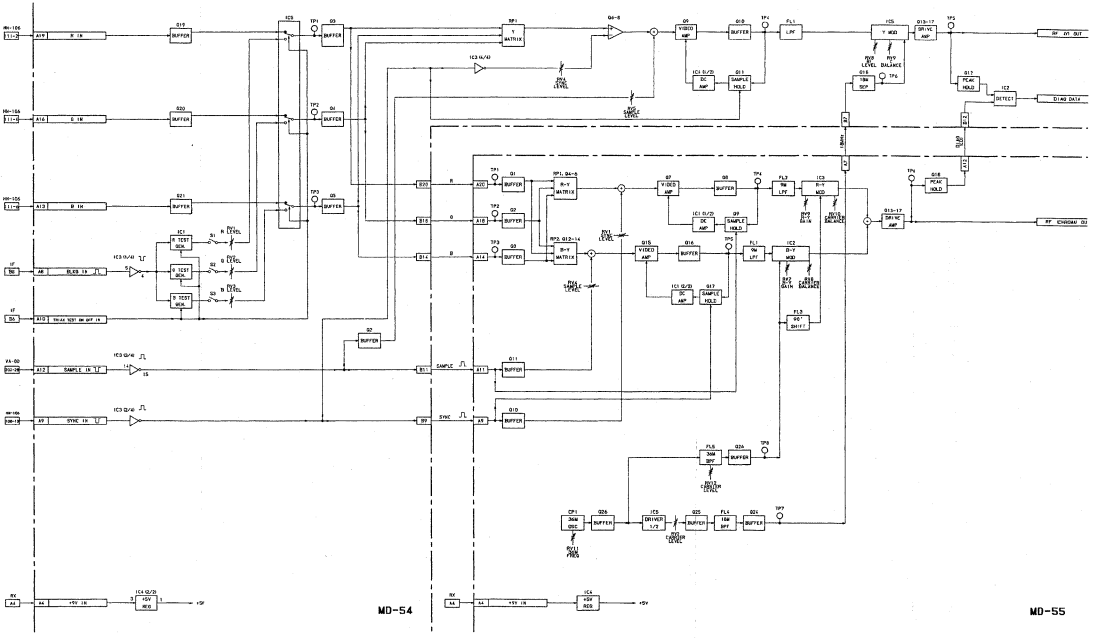


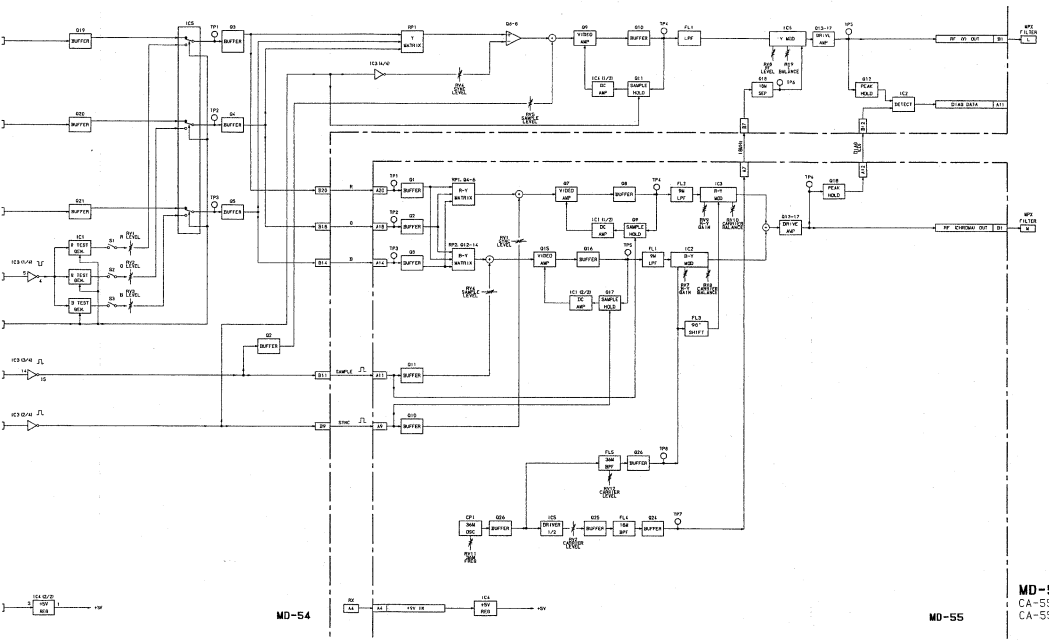
OVERALL B/D


CA-55/55P
RX-6
MD-54
MD-55
IF-227
SW-312
VA-80
TR-47
DC-43
DC-42
CCU-355/355P
DM-67
VA-81
EN-64
IF-177 (1/2)
IF-177 (2/2)
CP-120
AT-51
SG-131
AU-98
TR-46
FL-70
FL-62
MPX FILTER
SW REGULATOR
DP-91
SOFIA CONNECTOR
RECEPTACLE MALE 26P
CA-55/55P OVERALL BLOCK

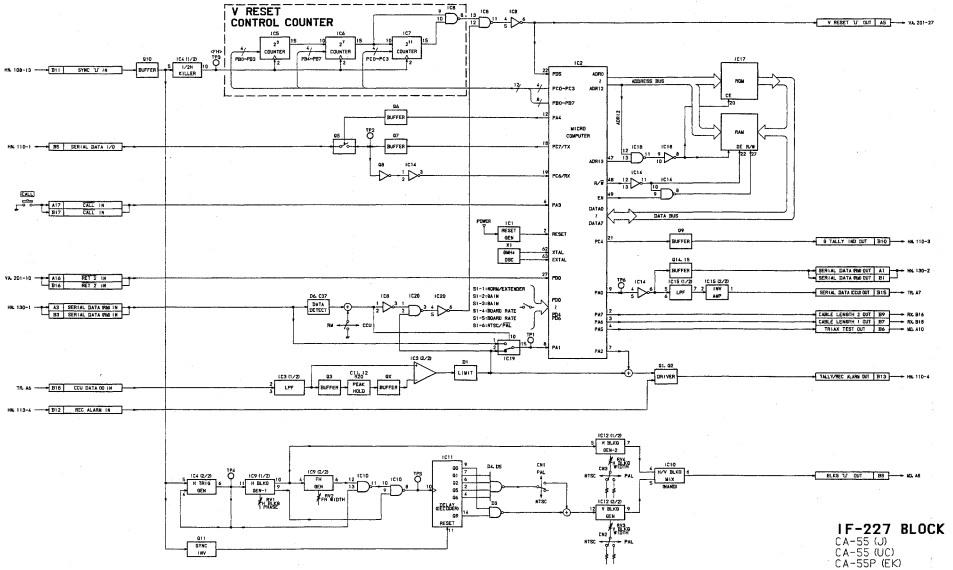
MD-54/55 BLOCK

MD-54/55 BLOCK MD-54/55 BLOCK

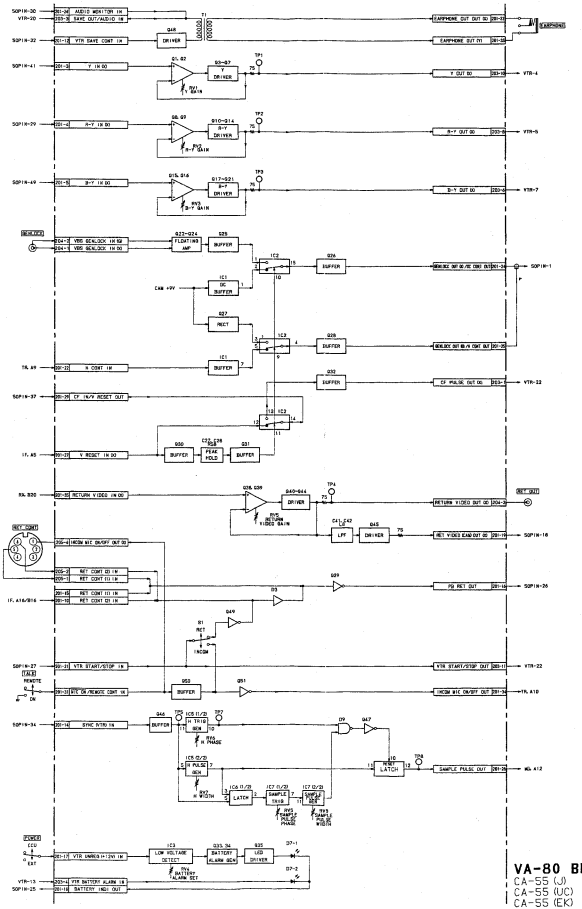




MD-54/55 BLOCK
CA-55 (J, UC)
CA-55P (EK)

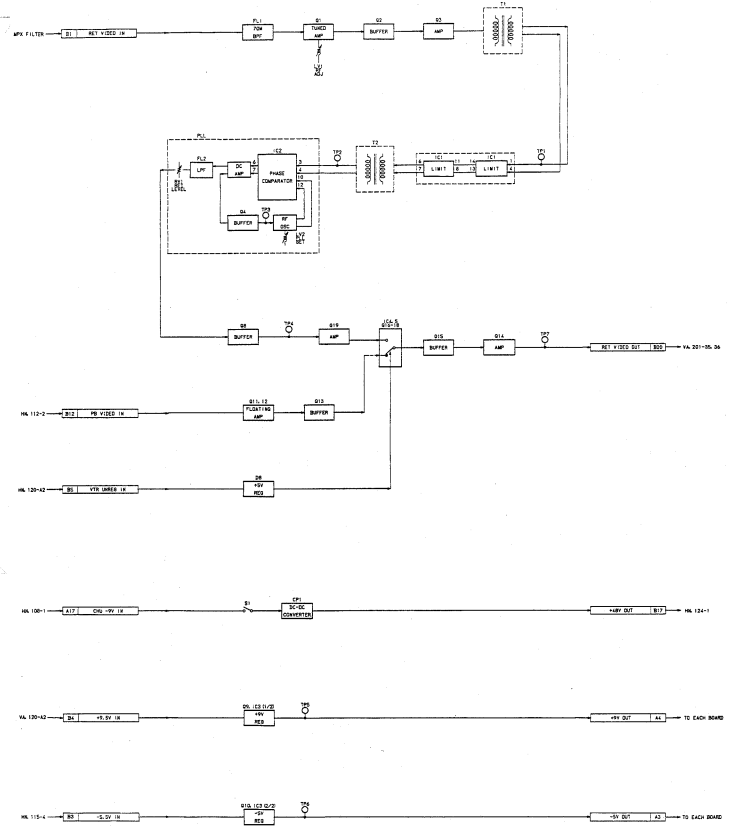

V RESET
CONTROL COUNTER
V RESET 'L' OUT
SYNC 'L' IN
SERIAL DATA I/O
CRCC IN
CRCC OUT
REF 2 IN
REF 2 OUT
SERIAL DATA RMI IN
SERIAL DATA RMI OUT
CCU DATA OUT
REC ALARM IN
B TALLY IND OUT
SERIAL DATA RMI OUT
SERIAL DATA ECO OUT
CABLE LENGTH 1 OUT
CABLE LENGTH 2 OUT
TRIAX TEST OUT
TALLY/REC ALARM OUT
BLKG 'L' OUT
MICRO COMPUTER
ADDRESS BUS
DATA BUS
ROM
RAM
BUFFER
LIMITER
DRIVER
SYNC
IF-227 BLOCK
CA-55 (J)
CA-55 (UC)
CA-55P (EK)

VA-80 BLOCK



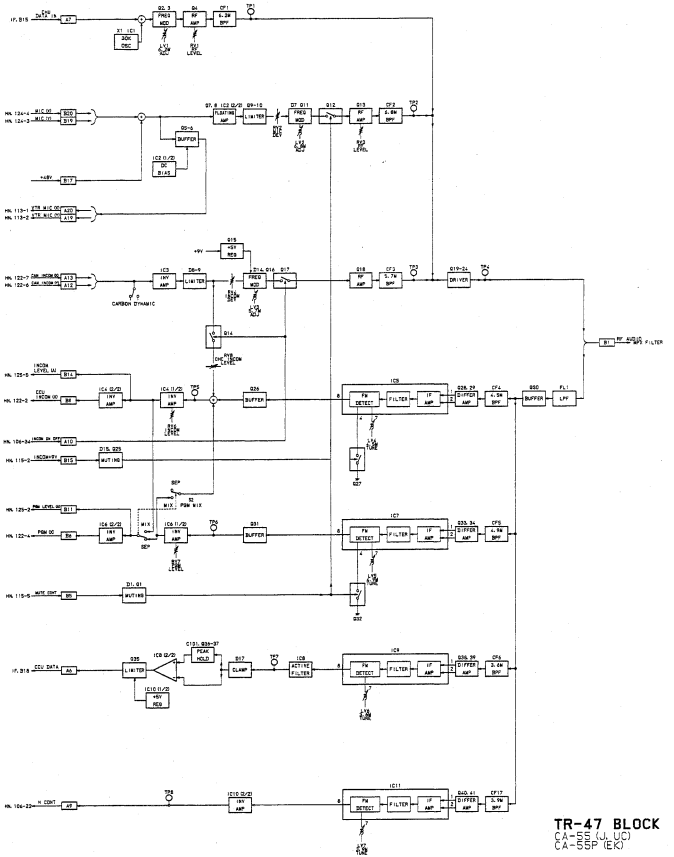
VA-80 BLOCK
CA-55 (J)
CA-55 (UC)
CA-55 (EK)

RX-6 BLOCK



RX-6 BLOCK
CA-55 (J, UC)
CA-55P (EK)

TR-47 BLOCK



TR-47 BLOCK
CA-55 (J, UC)
CA-55P (EK)

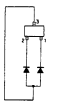
SECTION B
SEMICONDUCTOR PIN ASSIGNMENTS

The circuit diagram of IC is obtained from the IC data book published by the manufacturer.

TYPE	PAGE
1S2835	B-2
1S2837	B-2
1SS123	B-2
1SS97	B-2
1SZ46A	B-2
1SZ47A	B-2
1T33	B-2
2SA1226	B-2
2SA1330	B-2
2SA1385	B-2
2SA1462	B-2
2SA812	B-2
2SB733	B-2
2SC1009A	B-2
2SC1623	B-2
2SC2026	B-2
2SC2238B	B-2
2SC2440	B-2
2SC2668	B-2
2SC2714	B-2
2SC2757	B-2
2SC2758	B-2
2SC3115	B-2
2SC3360	B-2
2SC634SP	B-2
2SD1033	B-2
2SD773	B-2
2SK94	B-2
74F175PC	B-3
CA3102E-S	B-3
CXA1165M	B-3
DTC114EK	B-2
ERA82-004	B-2
ERB81-004	B-2
ESAC82-004	B-2
FC53M	B-2
GM-3	B-2
HD63B05Y2F	B-3
HM6264LFP-15T	B-4
HN27C64G-20	B-4
HSM88AS	B-2
MC14040BF	B-5
MC14053BF	B-6
NJM1496M	B-5
NJM4556M-A	B-5
NJM4560M	B-5
NJM78L05A	B-5
NJM78M09A	B-5
RD ? ?ES-B ?	B-2
RD ? ?E-B ?	B-2
RD ? ?E-L ?	B-2
RD ? ?FB ?	B-2
TA7303P	B-5
TC4040BF	B-5
TC4049BF	B-6
TC4053BF	B-6
TC4073BF	B-6
TC40H000F	B-6
TC40H163F	B-6
TC4538BF	B-6
TC4SU69F	B-6
TC504013BF	B-7
TC74HC4538F	B-6
TL062CPS	B-7
TL082CPS	B-7
TL1451ACNS	B-7
TL7700CPS	B-7
uPC393G2	B-7

DIODE, TRANSISTOR

TOP VIEW (SCALE 4/1)



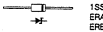
1S2835

TOP VIEW (SCALE 4/1)

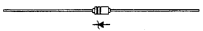
1S2837

TOP VIEW (SCALE 4/1)

1SS123
HSM88AS



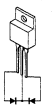
1SS97
ERA82-004
ERB81-004



1SZ46A
1SZ47A

1T33

GM-3



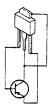
ESAC82-004

FC53M

RD ? ?EB ?
RD ? ?EL ?
RD ? ?ESB ?
RD ? ?FB ?

TOP VIEW (SCALE 4/1)

2SA1226
2SA1330
2SA1462
2SA812



2SA1385

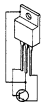
2SB733

TOP VIEW (SCALE 4/1)

2SC1009A
2SC1623
2SC2714
2SC2757
2SC2758
2SC3115
2SC3360

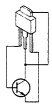
2SC2026

2SC2238B



2SC2440

2SC2668
2SC634SP



2SD1033

2SD773

TOP VIEW (SCALE 4/1)

2SK94

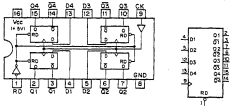
TOP VIEW (SCALE 4/1)

DTC114EK (R1 = 10K, R2 = 10K)

74F175PC (FSC)

TTL D-TYPE FLIP-FLOP WITH CLEAR

– TOP VIEW –



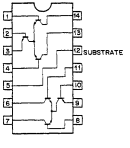
RD	CK	D	Q	$\overline{Q}$
0	X	X	0	1
1	↑	1	1	0
1	↑	0	0	1
1	0	X	Q_0	$\overline{Q}_0$

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

CA3102E-S (RCA)

HIGH FREQ.DIFFERNTIAL AMPLIFIER

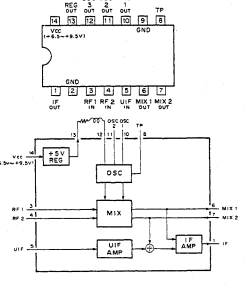
– TOP VIEW –



CXA1165M (SONY) FLAT PACKAGE

CATV VHF TUNER

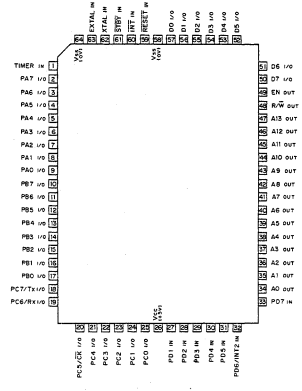
– TOP VIEW –

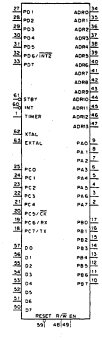


HD6305Y2F (HITACHI)

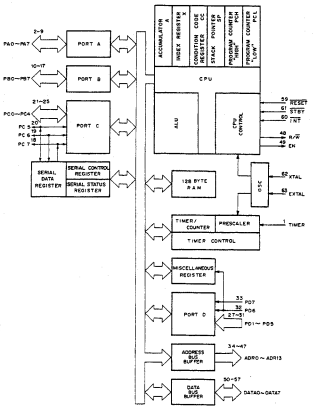
C-MOS 8-BIT MICROPROCESSOR UNIT

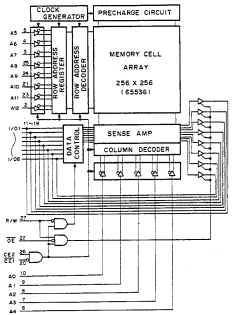
– TOP VIEW –



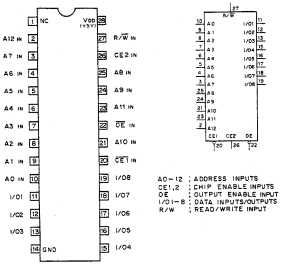


A0~A13	: 14-BIT ADDRESS BUS OUT
D0~D7	: 8-BIT DATA BUS I/O
PA0~PA7	: 8-BIT I/O PORT A
PB0~PB7	: 8-BIT I/O PORT B
PC0~PC7	: 8-BIT I/O PORT C
PD1~PD7	: 7-BIT IN PORT D
RESET	: RESET IN
STBY	: STANDBY IN
EN	: ENABLE OUT
R/W	: READ/WRITE OUT
INT	: INTERRUPT IN
INT2	: INTERRUPT IN
TIMER	: TIMER CONTROL IN
TIMER2	: TIMER CONTROL IN
XTAL	: CRYSTAL
EXTAL	: EXTERNAL CRYSTAL IN
CK	: SERIAL INTERFACE CLOCK I/O
RX	: SERIAL DATA RECEIVE
TX	: SERIAL DATA TRANSMIT





HM6264LFP-15T (HITACHI) (ACCESS TIME = 150 nS) FLAT PACKAGE
C-MOS 8192 WORDx8-BIT STATIC RAM
– TOP VIEW –

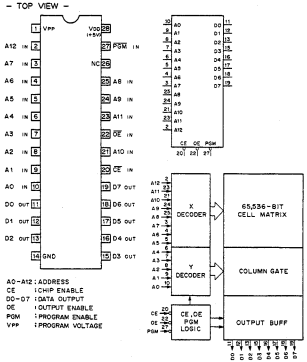


A0–12 ; ADDRESS INPUTS
CE1,2 ; CHIP ENABLE INPUTS
OE ; OUTPUT ENABLE INPUT
I/O1–8 ; DATA INPUTS/OUTPUTS
R/W ; READ/WRITE INPUT

MODE	CE1	CE2	OE	R/W	I/O1~8
READ	0	1	0	1	DATA OUTPUTS
WRITE	0	1	X	0	DATA INPUTS
OUTPUT DESELECT	0	1	1	1	HI-Z
STANDBY	1	X	X	X	HI-Z
	X	0	X	X	HI-Z

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE
HI-Z ; HIGH IMPEDANCE

HN27C64G-20 (HITACHI) (ACCESS TIME = 200 nS)
C-MOS 64K (8K-8) ERASABLE PROM WITH 3-STATE OUTPUTS
– TOP VIEW –



A0–A12 : ADDRESS
CE : CHIP ENABLE
D0–D7 : DATA OUTPUT
OE : OUTPUT ENABLE
PGM : PROGRAM ENABLE
VPP : PROGRAM VOLTAGE

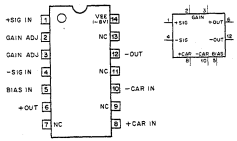
	CE	OE	PGM	VPP	Dn	FUNCTION
An	0	0	1	+5V	D OUT	READ
An	0	1	1	+5V	HI-Z	OUTPUT DISABLE
An	0	0	0	+5V	HI-Z	OUTPUT DISABLE
X	1	X	X	+5V	HI-Z	STANDBY
An	0	X	1	+21V	Dn	PGM
An	0	0	1	+21V	D OUT	PGM VERIFY
X	1	X	X	+21V	HI-Z	PGM INH

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE
HI-Z ; HIGH IMPEDANCE

NJM1496M (JRC) FLAT PACKAGE

BALANCED MODULATOR/DEMODULATOR

– TOP VIEW –



NJM4556M-A (JRC) FLAT PACKAGE

OPERATIONAL AMPLIFIER

– TOP VIEW –

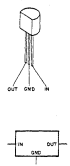
NJM4560M (JRC) FLAT PACKAGE

OPERATIONAL AMPLIFIER

– TOP VIEW –

NJM78L ? ?A (NEC)

POSITIVE VOLTAGE REGULATOR (100mA)

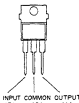


OUTPUT VOLTAGE	NJM78L??A	uA78L??ACL	uA78L??AWV	uPC78L??J	AN78L??
+2.6V	NJM78L02A	uA78L02ACL	uA78L26AWV	---------	--------
+4V	---------	---------	---------	---------	AN78L04
+5V	NJM78L05A	uA78L05ACL	uA78L05AWV	uPC78L05J	AN78L05
+6V	NJM78L06A	---------	---------	---------	AN78L06
+6.2V	---------	uA78L06ACL	uA78L62AWV	---------	--------
+7V	---------	---------	---------	---------	AN78L07
+8V	NJM78L08A	uA78L08ACL	---------	uPC78L08J	AN78L08
+8.2V	---------	---------	uA78L82AWV	---------	--------
+9V	NJM78L09A	uA78L09ACL	uA78L09AWV	---------	AN78L09
+10V	---------	uA78L10ACL	---------	uPC78L10J	AN78L10
+12V	NJM78L12A	uA78L12ACL	uA78L12AWV	uPC78L12J	AN78L12
+15V	NJM78L15A	uA78L15ACL	uA78L15AWV	uPC78L15J	AN78L15
+18V	NJM78L18A	---------	uA78L18AWV	---------	AN78L18
+20V	NJM78L20A	---------	---------	---------	AN78L20
+24V	NJM78L24A	---------	uA78L24AWV	---------	AN78L24

NJM78M ? ?A (JRC)

POSITIVE VOLTAGE REGULATOR (500mA)

– FRONT VIEW –

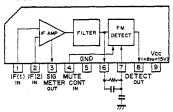


5V	NJM78M05A
6V	NJM78M06A
8V	NJM78M08A
9V	NJM78M09A
12V	NJM78M12A
15V	NJM78M15A
18V	NJM78M18A
20V	NJM78M20A
24V	NJM78M24A

TA7303P (TOSHIBA)

FM IF AMPLIFIER/DETECTOR

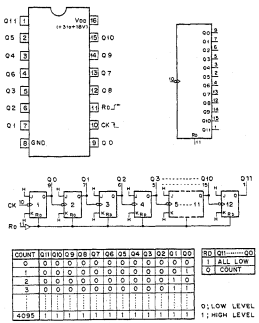
– SIDE VIEW –



MC14040BF (MOTOROLA) FLAT PACKAGE

C-MOS 12-STAGE RIPPLE CARRY BINARY COUNTER/DIVIDER

– TOP VIEW –



COUNT	Q11	Q10	Q9	Q8	Q7	Q6	Q5	Q4	Q3	Q2	Q1	Q0
0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	1
2	0	0	0	0	0	0	0	0	0	0	1	0
3	0	0	0	0	0	0	0	0	0	0	1	1
4095	1	1	1	1	1	1	1	1	1	1	1	1

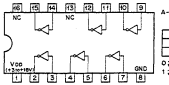
Ro	Q11……Q0
1	ALL LOW
0	COUNT

0 : LOW LEVEL
1 : HIGH LEVEL

TC4049BF (TOSHIBA) FLAT PACKAGE

C-MOS INVERTING TYPE BUFFER/CONVERTER

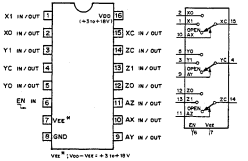
– TOP VIEW –



MC14053BF (MOTOROLA) FLAT PACKAGE

C-MOS 2-CHANNEL MULTIPLEXER/DEMULTIPLEXER

– TOP VIEW –



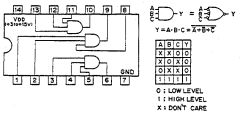
CONT. INPUTS		ON
EN	A (X,Y,Z)	CHANNEL
0	0	0
0	1	1
1	X	OPEN

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE.

TC4073BF (TOSHIBA) FLAT PACKAGE

C-MOS 3-INPUT POSITIVE AND GATE

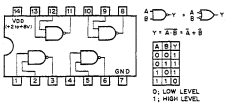
– TOP VIEW –



TC40H000F (TOSHIBA) FLAT PACKAGE

C-MOS 2-INPUT NAND GATE

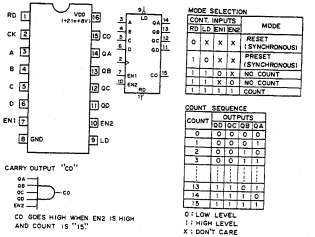
– TOP VIEW –



TC40H163F (TOSHIBA) FLAT PACKAGE

C-MOS PRESETTABLE SYNCHRONOUS 4-BIT BINARY COUNTER

– TOP VIEW –



MODE SELECTION				
CONT. INPUTS				MODE
RD	LD	EN1	EN2	
0	X	X	X	RESET (SYNCHRONOUS)
1	0	X	X	PRESET (SYNCHRONOUS)
1	1	0	X	NO COUNT
1	1	X	0	NO COUNT
1	1	1	1	COUNT

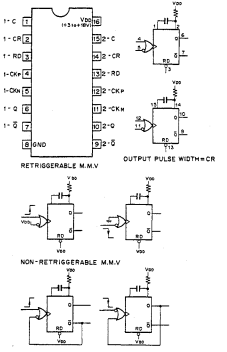
COUNT SEQUENCE				
COUNT	OUTPUTS			
	QD	QC	QB	QA
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
:	:	:	:	:
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

TC4538BF (TOSHIBA) FLAT PACKAGE
TC74HC4538F (TOSHIBA) FLAT PACKAGE

C-MOS DUAL RETRIGGERABLE/NON-RETRIGGERABLE MONOSTABLE MULTIVIBRATOR

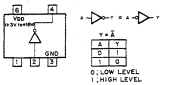
– TOP VIEW –



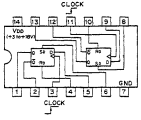
TC4SU69F (TOSHIBA) FLAT PACKAGE

C-MOS INVERTER BUFFER

– TOP VIEW –



TC504013BF (TOSHIBA) FLAT PACKAGE
C²MOS D-TYPE FLIP FLOP WITH DIRECT SET/RESET
– TOP VIEW –



DIRECT R-S FLIP FLOP			D-TYPE FLIP FLOP	
S	R	Q	CK	Q
0	0	Qn	0	Qn
0	1	0	0	0
1	0	1	1	1
1	1	0		

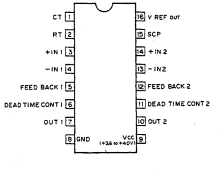
CLOCK CK: ↓
CKn: BEFORE CLOCK
CKn+1: AFTER CLOCK

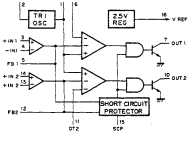
0: LOW LEVEL
1: HIGH LEVEL

TL062CPS (TI) FLAT PACKAGE
OPERATIONAL AMPLIFIER
(JFET INPUT)
– TOP VIEW –

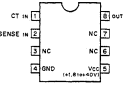
TL082CPS (TI) FLAT PACKAGE
OPERATIONAL AMPLIFIER
(J FET-INPUT)
– TOP VIEW –

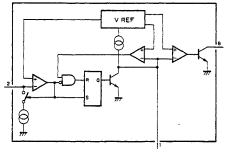
TL1451ACNS (TI) FLAT PACKAGE
DUAL PWM POWER CONTROLLER
– TOP VIEW –





TL7700CPS (TI) FLAT PACKAGE
VARIABLE SUPPLY VOLTAGE SUPERVISOR
– TOP VIEW –

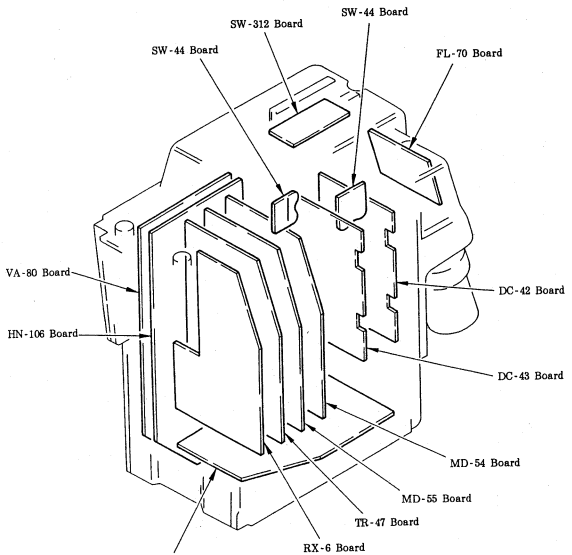




uPC393G2 (NEC) FLAT PACKAGE
VOLTAGE COMPARATOR
– TOP VIEW –

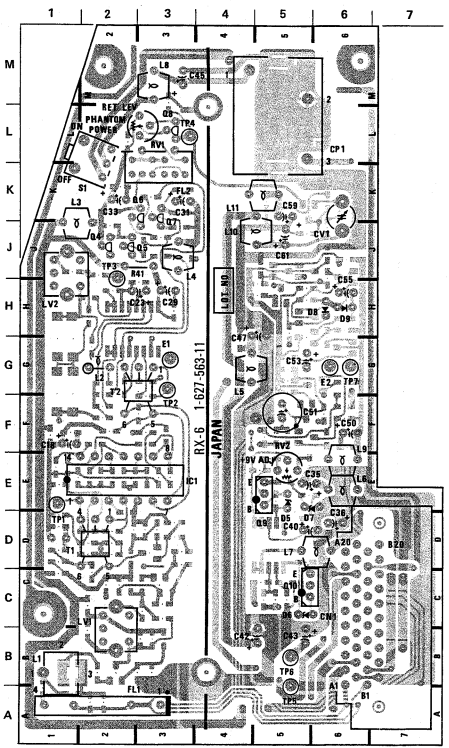
SECTION C
SCHEMATIC DIAGRAMS AND BOARD ILLUSTRATIONS

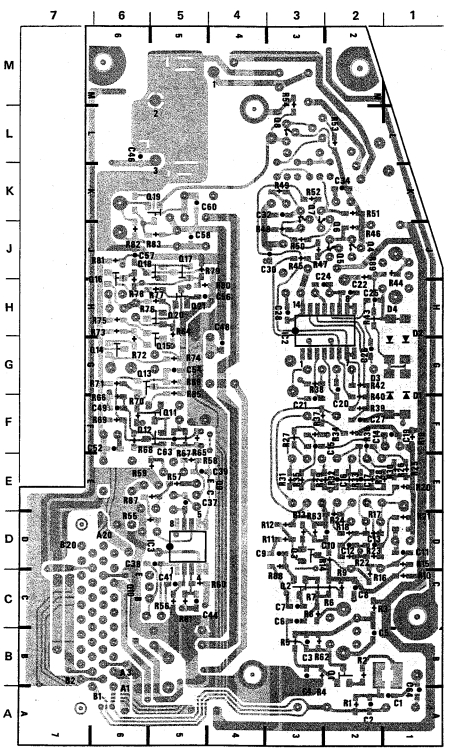
RD LAYOUT



RX-6 BOARD

RX-6 (1-627-563-11)	
CN1	C-7C
CP1	L-5C
CV1	K-6C
D1	F-1S
D2	G-1S
D3	F-1S
D4	G-1S
D5	E-5C
D6	C-5C
D7	E-6C
D8	H-6C
D9	H-6C
E1	G-3C
E2	G-6C
FL1	A-2C
FL2	K-3C
IC1	E-2C
IC2	H-3S
IC3	D-5S
LV1	B-2C
LV2	J-1C
Q1	B-2S
Q2	C-3S
Q3	D-3S
Q4	J-2C
	J-2S
Q5	J-2C
	J-2S
Q6	K-3C
	K-3S
Q7	K-3C
	K-3S
Q8	L-3C
	L-3S
Q9	E-5C
	E-4S
Q10	C-5C
	C-6S
Q11	F-5S
Q12	F-5S
Q13	G-6S
Q14	G-6S
Q15	G-5S
Q16	J-6S
Q17	J-5S
Q18	J-5S
Q19	K-5S
Q20	H-5S
Q21	H-5S
RV1	L-3C
RV2	E-5C
S1	K-2C
T1	D-2C
T2	G-3C

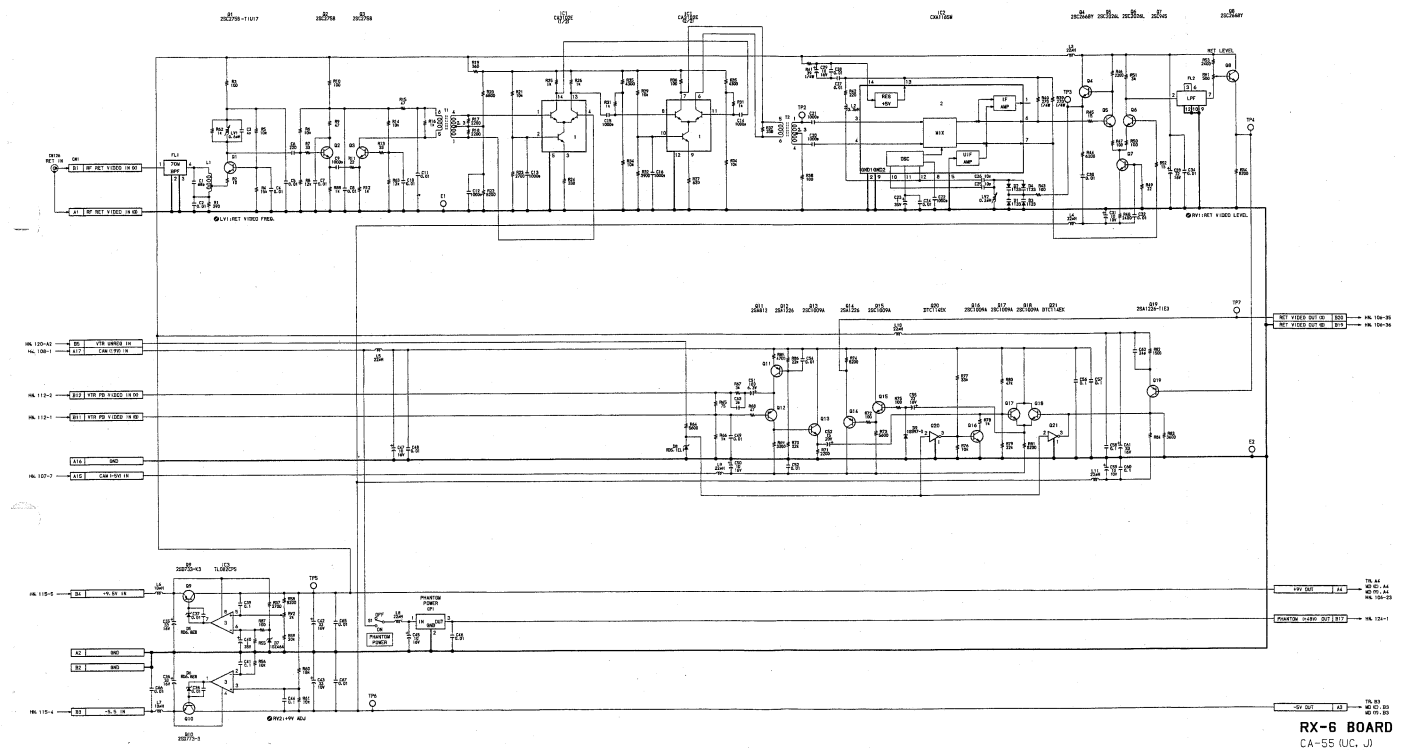




1-627-563-11 SOLDERING SIDE

RX-6 (1-627-563-11)
CN1 C-7C
CP1 L-5C
CV1 K-6C
D1 F-1S
D2 G-1S
D3 F-1S
D4 G-1S
D5 E-5C
D6 C-5C
D7 E-6C
D8 H-6C
D9 H-6C
E1 G-3C
E2 G-6C
FL1 A-2C
FL2 K-3C
IC1 E-2C
IC2 H-3S
IC3 D-5S
LV1 B-2C
LV2 J-1C
Q1 B-2S
Q2 C-3S
Q3 D-3S
Q4 J-2C
J-2S
Q5 J-2C
J-2S
Q6 K-3C
K-3S
Q7 K-3C
K-3S
Q8 L-3C
L-3S
Q9 E-5C
E-4S
Q10 C-5C
C-6S
Q11 F-5S
Q12 F-5S
Q13 G-6S
Q14 G-6S
Q15 G-5S
Q16 J-6S
Q17 J-5S
Q18 J-5S
Q19 K-5S
Q20 H-5S
Q21 H-5S
RV1 L-3C
RV2 E-5C
S1 K-2C
T1 D-2C
T2 G-3C

-6 BOARD
RN VIDEO AMP



RX-6 BOARD
CA-55 (UC, J)
CA-55P (EK)

CA-55 (UC)1-R2
CA-55 (J)1-R2
CA-55P (EK)1-R2

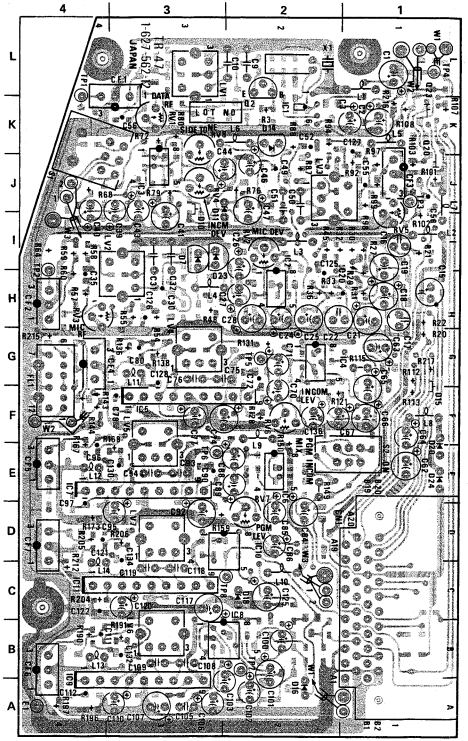
C-5 C-6

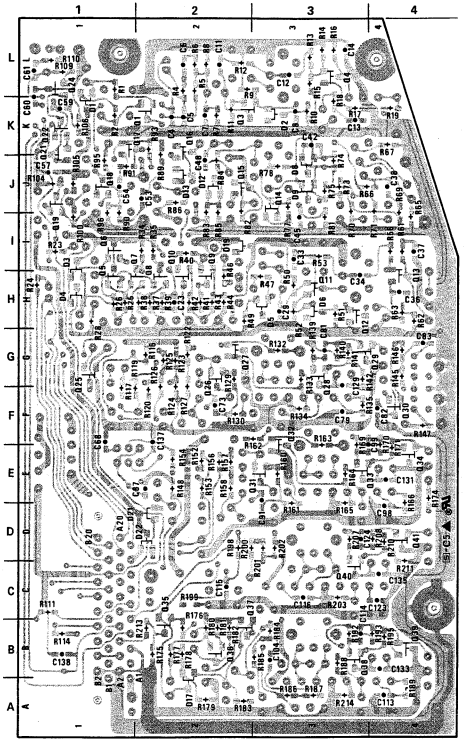
A | B | C | D | E | F

TR-47 BOARD

TR-47 (1-627-562-12)

CF1	K-3C	Q1	K-2S
CF2	H-4C	Q2	L-2C
CF3	J-1C	Q3	K-2S
CF4	G-4C	Q4	L-3S
CF5	E-4C	Q5	H-1S
CF6	B-4C	Q6	I-1S
CF7	D-4C	Q7	H-1S
		Q8	H-2S
CN1	C-1C	Q9	H-2S
		Q10	H-2S
D1	K-1S	Q11	H-3S
D2	K-3S	Q12	H-3S
D3	I-1S	Q13	H-4S
D4	H-1S	Q14	J-3S
D5	H-3S	Q15	J-2S
D6	H-3S	Q16	K-2S
D7	I-3C	Q17	K-1S
D8	J-3S	Q18	J-1S
D9	J-3S	Q19	J-1S
D10	J-3C	Q20	J-1C
D11	J-3C	Q21	K-1S
D12	J-2S	Q22	K-1S
D13	J-2S	Q23	K-1C
D14	K-2C	Q24	L-1S
D15	F-1C	Q25	G-1S
D16	A-2C	Q26	G-2S
D17	A-2S	Q27	G-2S
D18	C-2C	Q28	G-3S
D19	I-2S	Q29	G-3S
D20	E-1C	Q30	F-4S
D21	D-2S	Q31	E-3S
D22	D-2S	Q32	F-3S
D23	I-3C	Q33	E-3S
D24	E-1C	Q34	E-4S
		Q35	B-2S
E1	A-4C	Q36	B-2S
		Q37	B-2S
FL1	G-4C	Q38	B-3S
		Q39	B-4S
IC1	K-2C	Q40	C-3S
IC2	H-2C	Q41	D-4S
IC3	J-3C		
IC4	G-2C	RV1	K-3C
IC5	F-3C	RV2	I-2C
IC6	E-2C	RV3	H-4C
IC7	E-3C	RV4	J-3C
IC8	B-2C	RV5	I-1C
IC9	A-3C	RV6	F-2C
IC10	D-2C	RV7	D-2C
IC11	C-3C	RV8	K-3C
LV1	L-3C	S1	K-4C
LV2	H-3C	S2	E-1C
LV3	J-2C		
LV4	G-3C	TP1	K-4C
LV5	F-3C	TP2	I-4C
LV6	B-3C	TP3	J-1C
LV7	D-3C	TP4	L-1C
		TP5	G-2C
		TP6	E-3C
		TP7	E-3C
		TP8	C-2C
		X1	L-2C





1-627-562-12 SOLDERING SIDE

TR-47 (1-627-562-12)

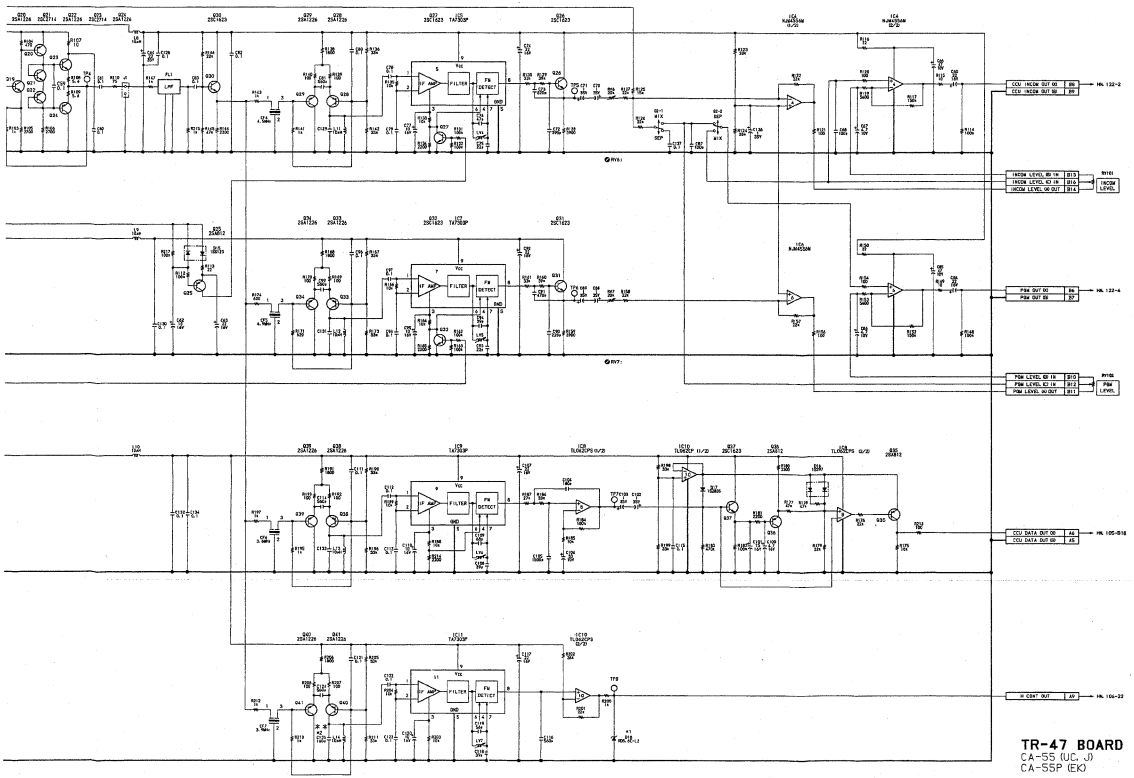
CF1	K-3C	Q1	K-2S
CF2	H-4C	Q2	L-2C
CF3	J-1C	Q3	K-2S
CF4	G-4C	Q4	L-3S
CF5	E-4C	Q5	H-1S
CF6	B-4C	Q6	I-1S
CF7	D-4C	Q7	H-1S
		Q8	H-2S
CN1	C-1C	Q9	H-2S
		Q10	H-2S
D1	K-1S	Q11	H-3S
D2	K-3S	Q12	H-3S
D3	I-1S	Q13	H-4S
D4	H-1S	Q14	J-3S
D5	H-3S	Q15	J-2S
D6	H-3S	Q16	K-2S
D7	I-3C	Q17	K-1S
D8	J-3S	Q18	J-1S
D9	J-3S	Q19	J-1S
D10	J-3C	Q20	J-1C
D11	J-3C	Q21	K-1S
D12	J-2S	Q22	K-1S
D13	J-2S	Q23	K-1C
D14	K-2C	Q24	L-1S
D15	F-1C	Q25	G-1S
D16	A-2C	Q26	G-2S
D17	A-2S	Q27	G-2S
D18	C-2C	Q28	G-3S
D19	I-2S	Q29	G-3S
D20	E-1C	Q30	F-4S
D21	D-2S	Q31	E-3S
D22	D-2S	Q32	F-3S
D23	I-3C	Q33	E-3S
D24	E-1C	Q34	E-4S
		Q35	B-2S
E1	A-4C	Q36	B-2S
		Q37	B-2S
FL1	G-4C	Q38	B-3S
		Q39	B-4S
IC1	K-2C	Q40	C-3S
IC2	H-2C	Q41	D-4S
IC3	J-3C		
IC4	G-2C	RV1	K-3C
IC5	F-3C	RV2	I-2C
IC6	E-2C	RV3	H-4C
IC7	E-3C	RV4	J-3C
IC8	B-2C	RV5	I-1C
IC9	A-3C	RV6	F-2C
IC10	D-2C	RV7	D-2C
IC11	C-3C	RV8	K-3C
LV1	L-3C	S1	K-4C
LV2	H-3C	S2	E-1C
LV3	J-2C		
LV4	G-3C	TP1	K-4C
LV5	F-3C	TP2	I-4C
LV6	B-3C	TP3	J-1C
LV7	D-3C	TP4	L-1C
		TP5	G-2C
		TP6	E-3C
		TP7	E-3C
		TP8	C-2C
		X1	L-2C

R-47 BOARD

TRANSMITTER FROM CAMERA TO CCU

* NOTE

MARK	ADDRESS	REF No.	DESCRIPTION	EFFECTIVE SER. NO.
#1		C49	DELETED	10001- (UC)
	C-5	C135	0.01 → 0.1	30016- (J)
				40131- (EK)
** #2	H-6	C135	180P → 150P	10001- (UC)
				30026- (J)
				40171- (EK)
#3	H-3	C29	220P → 390P	10126- (UC)
				20171- (J)
				40391- (EK)



TR-47 BOARD
CA-S5 (UC, J)
CA-S5P (EK)

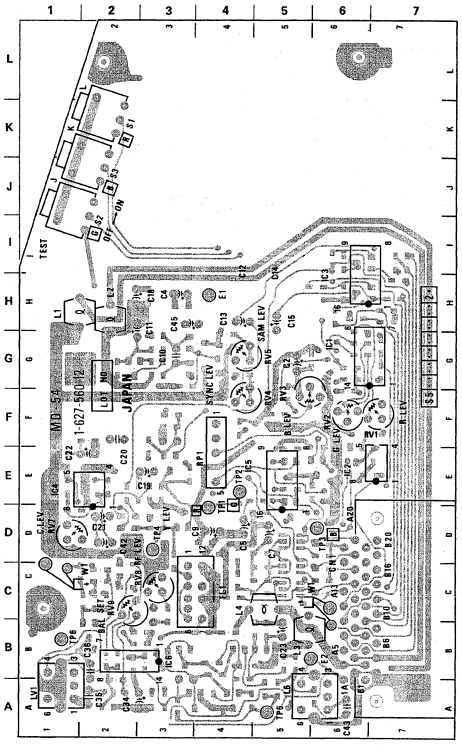
C-11 C-12

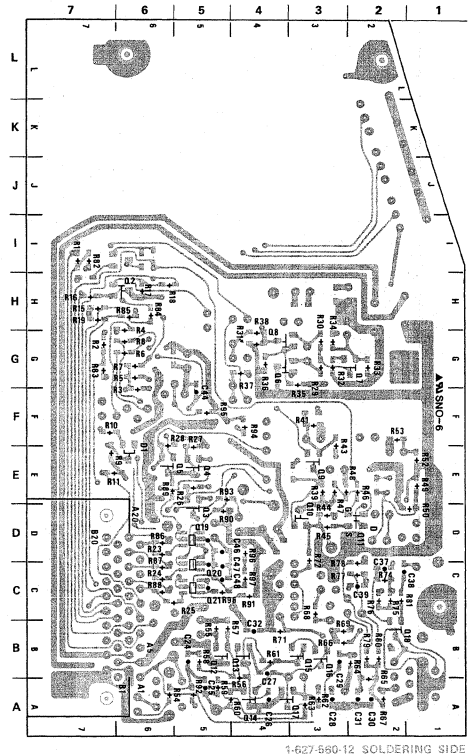
G H I J K L M

SER NO. 10001-10040 (UC)
30001-30025 (J)
40001-40170 (EK)

MD-54 BOARD

MD-54 (1-627-560-12)	
CN1	C-7C
D1	E-6S
E1	H-4C
E2	B-6C
FL1	C-4C
IC1	G-7C
IC2	E-7C
IC3	H-6C
IC4	E-2C
IC5	E-5C
IC6	B-2C
LV1	A-1C
Q2	H-6S
Q3	D-5S
Q4	E-5S
Q5	E-6S
Q6	G-4S
Q7	G-2S
Q8	G-4S
Q9	E-3S
Q10	D-3S
Q11	D-2S
Q12	B-5S
Q13	B-4S
Q14	A-4S
Q15	B-3S
Q16	B-3S
Q17	A-4S
Q18	B-2S
Q19	D-5S
Q20	C-5S
Q21	C-5S
RP1	E-4C
RV1	F-7C
RV2	F-6C
RV3	F-5C
RV4	F-4C
RV5	G-4C
RV7	D-1C
RV8	C-3C
RV9	C-2C
S1	K-2C
S2	J-1C
S3	J-2C
TP1	D-4C
TP2	E-4C
TP3	D-6C
TP4	D-3C
TP5	A-5C
TP6	B-1C





1-627-560-12 SOLDERING SIDE

MD-54 (1-627-560-12)
CN1 C-7C
D1 E-6S
E1 H-4C
E2 B-6C
FL1 C-4C
IC1 G-7C
IC2 E-7C
IC3 H-6C
IC4 E-2C
IC5 E-5C
IC6 B-2C
LV1 A-1C
Q2 H-6S
Q3 D-5S
Q4 E-5S
Q5 E-6S
Q6 G-4S
Q7 G-2S
Q8 G-4S
Q9 E-3S
Q10 D-3S
Q11 D-2S
Q12 B-5S
Q13 B-4S
Q14 A-4S
Q15 B-3S
Q16 B-3S
Q17 A-4S
Q18 B-2S
Q19 D-5S
Q20 C-5S
Q21 C-5S
RP1 E-4C
RV1 F-7C
RV2 F-6C
RV3 F-5C
RV4 F-4C
RV5 G-4C
RV7 D-1C
RV8 C-3C
RV9 C-2C
S1 K-2C
S2 J-1C
S3 J-2C
TP1 D-4C
TP2 E-4C
TP3 D-6C
TP4 D-3C
TP5 A-5C
TP6 B-1C

MD-55 BOARD

MD-55 (1-627-5	
CN1	C-7C C-7S
CP1	F-1C
E1	H-1C
E2	J-1C
E3	C-2C
E4	G-1C
FL1	C-4C
FL2	C-4C
FL3	B-1C
FL4	F-5C
FL5	E-1C
IC1	J-2C
IC2	B-3C
IC3	D-3C
IC4	E-3C
IC5	F-3C
Q1	G-7S
Q2	H-7S
Q3	H-7S
Q4	J-4S
Q5	J-4S
Q6	I-5S
Q7	I-4S
Q8	I-3S
Q9	I-2S
Q10	K-7S
Q11	K-7S
Q12	K-5S
Q13	J-4S
Q14	K-5S
Q15	K-4S
Q16	J-3S
Q17	J-2S
Q18	B-5S
Q19	B-4S
Q20	A-4S
Q21	B-4S
Q22	B-3S
Q23	A-4S
Q24	F-5S
Q25	E-5S
Q26	F-1S
Q27	C-1S
RP1	I-6C
RP2	K-6C

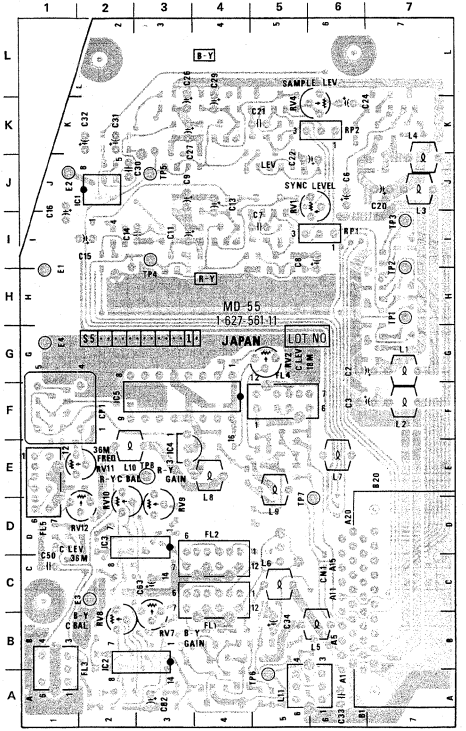
SER NO. 10001-10040 (UC)
30001-30025 (J)
40001-40170 (EK)

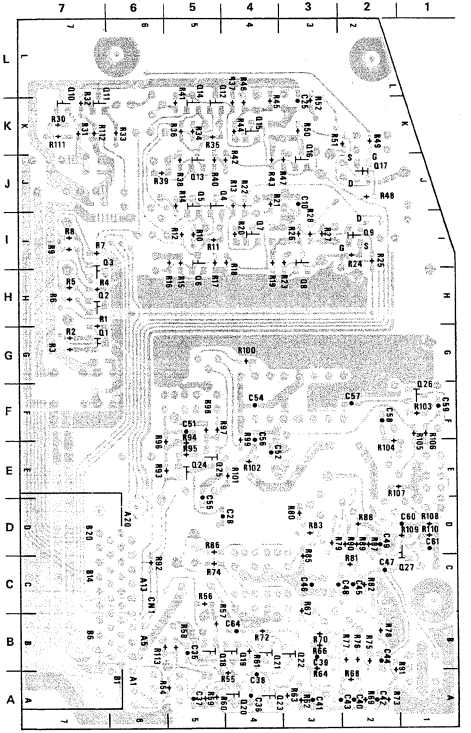
MD-55 BOARD

60-12)

MD-55 (1-627-561-11)

CN1	C-7C	RV1	J-6C
	C-7S	RV2	G-5C
		RV4	K-6C
CP1	F-1C	RV7	B-3C
		RV8	B-2C
E1	H-1C	RV9	D-3C
E2	J-1C	RV10	D-2C
E3	C-2C	RV11	E-2C
E4	G-1C	RV12	D-2C
FL1	C-4C	TP1	H-7C
FL2	C-4C	TP2	I-7C
FL3	B-1C	TP3	I-7C
FL4	F-5C	TP4	I-3C
FL5	E-1C	TP5	J-3C
		TP6	A-5C
IC1	J-2C	TP7	D-6C
IC2	B-3C	TP8	E-3C
IC3	D-3C		
IC4	E-3C		
IC5	F-3C		
Q1	G-7S		
Q2	H-7S		
Q3	H-7S		
Q4	J-4S		
Q5	J-4S		
Q6	I-5S		
Q7	I-4S		
Q8	I-3S		
Q9	I-2S		
Q10	K-7S		
Q11	K-7S		
Q12	K-5S		
Q13	J-4S		
Q14	K-5S		
Q15	K-4S		
Q16	J-3S		
Q17	J-2S		
Q18	B-5S		
Q19	B-4S		
Q20	A-4S		
Q21	B-4S		
Q22	B-3S		
Q23	A-4S		
Q24	F-5S		
Q25	E-5S		
Q26	F-1S		
Q27	C-1S		
RP1	I-6C		
RP2	K-6C		





MD-55 (1-627-561-11)

CN1	C-7C	RV1	J-6C
	C-7S	RV2	G-5C
		RV4	K-6C
CP1	F-1C	RV7	B-3C
		RV8	B-2C
E1	H-1C	RV9	D-3C
E2	J-1C	RV10	D-2C
E3	C-2C	RV11	E-2C
E4	G-1C	RV12	D-2C
FL1	C-4C	TP1	H-7C
FL2	C-4C	TP2	I-7C
FL3	B-1C	TP3	I-7C
FL4	F-5C	TP4	I-3C
FL5	E-1C	TP5	J-3C
		TP6	A-5C
IC1	J-2C	TP7	D-6C
IC2	B-3C	TP8	E-3C
IC3	D-3C		
IC4	E-3C		
IC5	F-3C		
Q1	G-7S		
Q2	H-7S		
Q3	H-7S		
Q4	J-4S		
Q5	J-4S		
Q6	I-5S		
Q7	I-4S		
Q8	I-3S		
Q9	I-2S		
Q10	K-7S		
Q11	K-7S		
Q12	K-5S		
Q13	J-4S		
Q14	K-5S		
Q15	K-4S		
Q16	J-3S		
Q17	J-2S		
Q18	B-5S		
Q19	B-4S		
Q20	A-4S		
Q21	B-4S		
Q22	B-3S		
Q23	A-4S		
Q24	F-5S		
Q25	E-5S		
Q26	F-1S		
Q27	C-1S		
RP1	I-6C		
RP2	K-6C		

C-15(a)

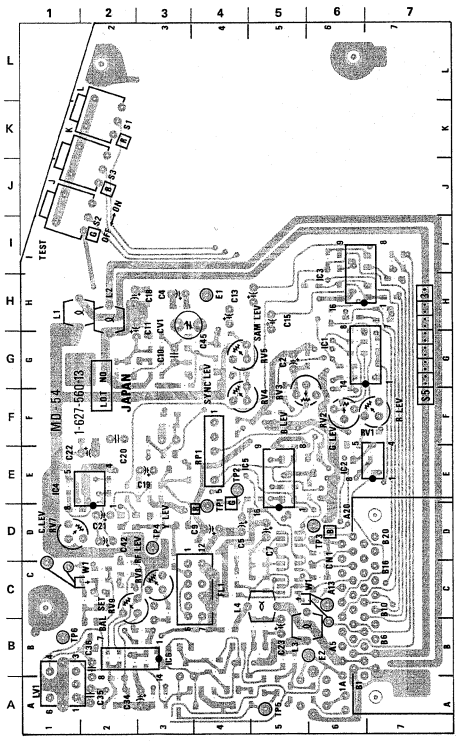
C-16(a)

SER NO. 10041- (UC)
30026- (J)
40171- (EK)

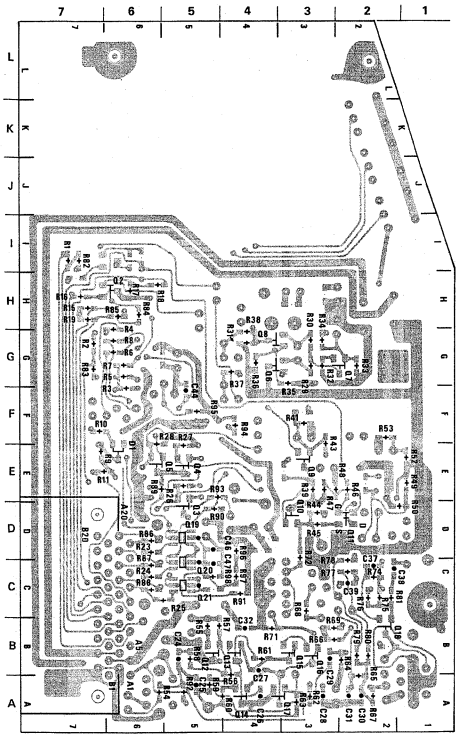
MD-54 BOARD

MD-54 (1-627-560-13)

CN1	C-7C
CV1	H-3C
D1	E-6S
E1	H-4C
E2	B-6C
FL1	C-4C
IC1	G-7C
IC2	E-7C
IC3	H-6C
IC4	E-2C
IC5	E-5C
IC6	B-2C
LV1	A-1C
Q2	H-6S
Q3	D-5S
Q4	E-5S
Q5	E-6S
Q6	G-4S
Q7	G-2S
Q8	G-4S
Q9	E-3S
Q10	D-3S
Q11	D-2S
Q12	B-5S
Q13	B-4S
Q14	A-4S
Q15	B-3S
Q16	B-3S
Q17	A-4S
Q18	B-2S
Q19	D-5S
Q20	C-5S
Q21	C-5S
RP1	E-4C
RV1	F-7C
RV2	F-6C
RV3	F-5C
RV4	F-4C
RV5	G-4C
RV7	D-1C
RV8	C-3C
RV9	C-2C
S1	K-2C
S2	J-1C
S3	J-2C
TP1	D-4C
TP2	E-4C
TP3	D-6C
TP4	D-3C
TP5	A-5C
TP6	B-1C



C-13(b)



C-14(b)

SER NO. 1(
3(
4(

MD-55 BOARD

MD-54 (1-627-560-13)

CN1	C-7C
	C-7S
CV1	H-3C
D1	E-6S
E1	H-4C
E2	B-6C
FL1	C-4C
IC1	G-7C
IC2	E-7C
IC3	H-6C
IC4	E-2C
IC5	E-5C
IC6	B-2C
LV1	A-1C
Q2	H-6S
Q3	D-5S
Q4	E-5S
Q5	E-6S
Q6	G-4S
Q7	G-2S
Q8	G-4S
Q9	E-3S
Q10	D-3S
Q11	D-2S
Q12	B-5S
Q13	B-4S
Q14	A-4S
Q15	B-3S
Q16	B-3S
Q17	A-4S
Q18	B-2S
Q19	D-5S
Q20	C-5S
Q21	C-5S
RP1	E-4C
RV1	F-7C
RV2	F-6C
RV3	F-5C
RV4	F-4C
RV5	G-4C
RV7	D-1C
RV8	C-3C
RV9	C-2C
S1	K-2C
S2	J-1C
S3	J-2C
TP1	D-4C
TP2	E-4C
TP3	D-6C
TP4	D-3C
TP5	A-5C
TP6	B-1C

MD-55 (1-627-561-12)

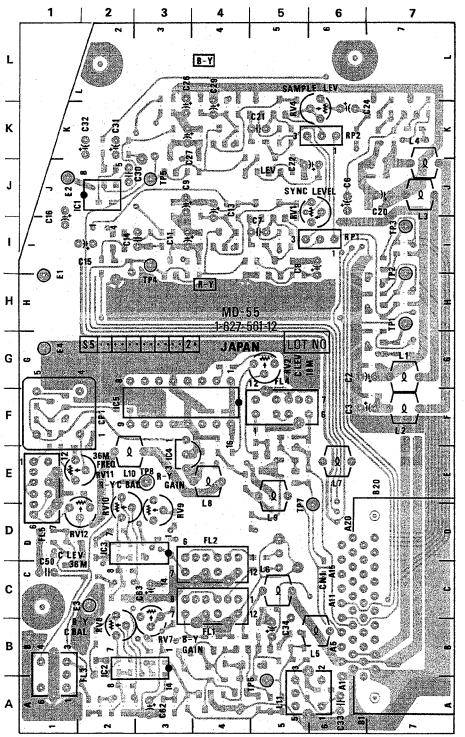
CN1	C-7C	RV1	J-
	C-7S	RV2	G-
		RV4	K-
CP1	F-1C	RV7	B-
		RV8	B-
E1	H-1C	RV9	D-
E2	J-1C	RV10	D-
E3	C-2C	RV11	E-
E4	G-1C	RV12	D-
FL1	C-4C	TP1	H-
FL2	C-4C	TP2	I-
FL3	B-1C	TP3	I-
FL4	F-5C	TP4	I-
FL5	E-1C	TP5	J-
		TP6	A-
IC1	J-2C	TP7	D-
IC2	B-3C	TP8	E-
IC3	D-3C		
IC4	E-3C		
IC5	F-3C		
Q1	G-7S		
Q2	H-7S		
Q3	H-7S		
Q4	J-5S		
Q5	J-5S		
Q6	I-5S		
Q7	I-4S		
Q8	I-3S		
Q9	I-2S		
Q10	K-7S		
Q11	K-7S		
Q12	K-5S		
Q13	J-5S		
Q14	K-5S		
Q15	K-4S		
Q16	J-3S		
Q17	J-2S		
Q18	B-5S		
Q19	B-4S		
Q20	A-4S		
Q21	B-4S		
Q22	B-3S		
Q23	A-4S		
Q24	E-5S		
Q25	E-5S		
Q26	F-1S		
Q27	C-1S		
RP1	I-6C		
RP2	K-6C		

SER NO. 10041-	(UC)
30026-	(J)
40171-	(EK)

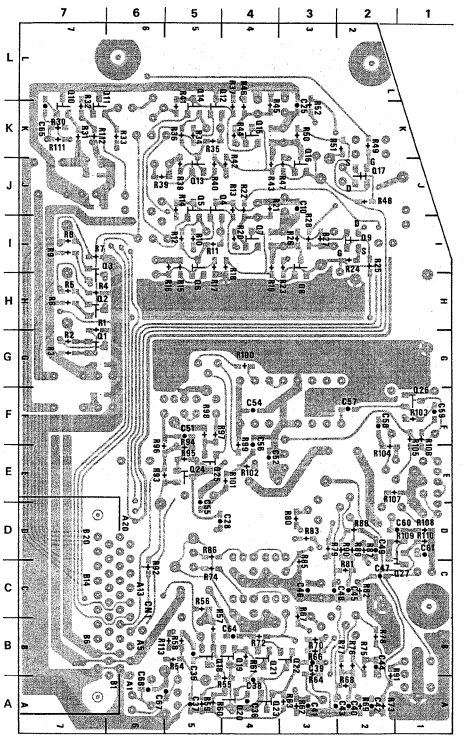
MD-55 BOARD

MD-55 (1-627-561-12)

CN1	C-7C	RV1	J-6C
	C-7S	RV2	G-5C
		RV4	K-6C
CP1	F-1C	RV7	B-3C
		RV8	B-2C
E1	H-1C	RV9	D-3C
E2	J-1C	RV10	D-2C
E3	C-2C	RV11	E-2C
E4	G-1C	RV12	D-2C
FL1	C-4C	TP1	H-7C
FL2	C-4C	TP2	I-7C
FL3	B-1C	TP3	I-7C
FL4	F-5C	TP4	I-3C
FL5	E-1C	TP5	J-3C
		TP6	A-5C
IC1	J-2C	TP7	D-6C
IC2	B-3C	TP8	E-3C
IC3	D-3C		
IC4	E-3C		
IC5	F-3C		
Q1	G-7S		
Q2	H-7S		
Q3	H-7S		
Q4	J-5S		
Q5	J-5S		
Q6	I-5S		
Q7	I-4S		
Q8	I-3S		
Q9	I-2S		
Q10	K-7S		
Q11	K-7S		
Q12	K-5S		
Q13	J-5S		
Q14	K-5S		
Q15	K-4S		
Q16	J-3S		
Q17	J-2S		
Q18	B-5S		
Q19	B-4S		
Q20	A-4S		
Q21	B-4S		
Q22	B-3S		
Q23	A-4S		
Q24	E-5S		
Q25	E-5S		
Q26	F-1S		
Q27	C-1S		
RP1	I-6C		
RP2	K-6C		



1-627-561-12 SOLDERING SIDE

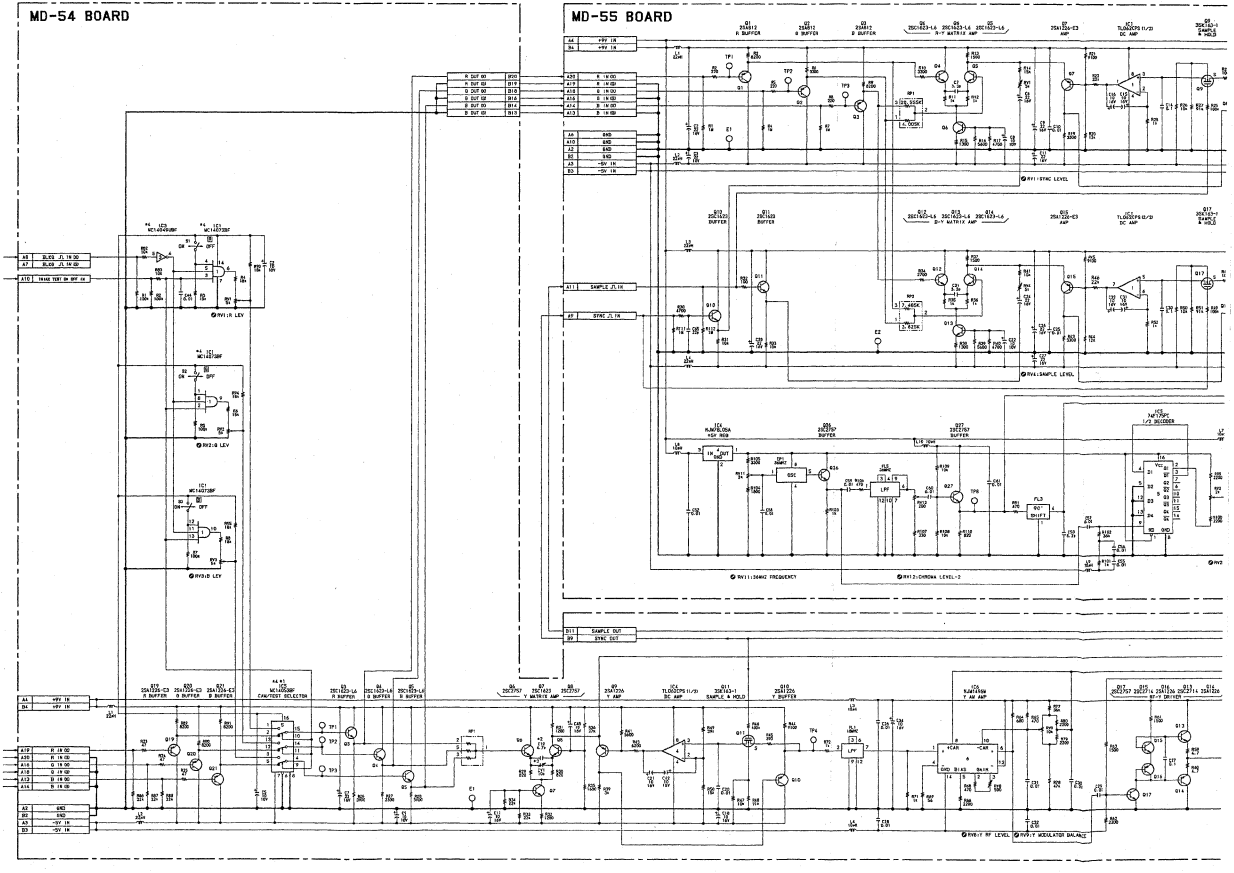


1-627-561-12 SOLDERING SIDE

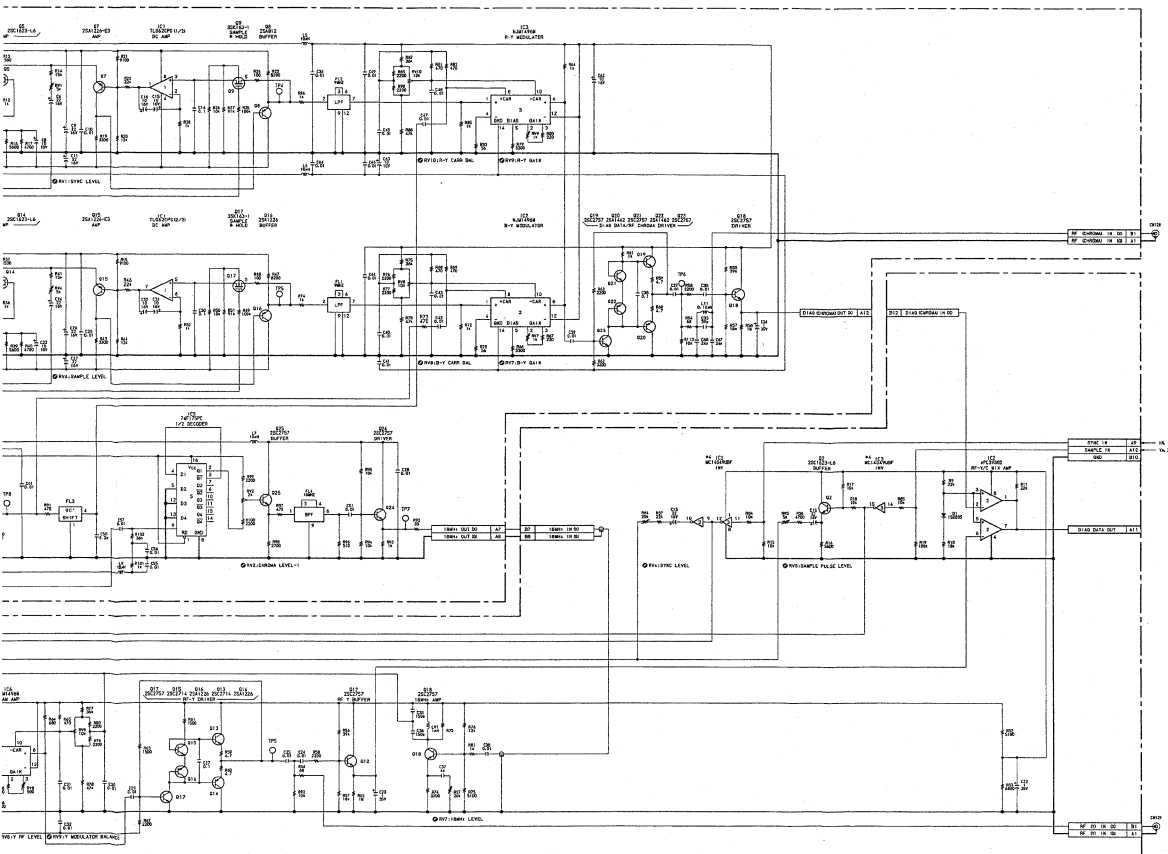
MD-55 (1-627-561-12)

CN1	C-7C	RV1	J-6C
	C-7S	RV2	G-5C
		RV4	K-6C
CP1	F-1C	RV7	B-3C
		RV8	B-2C
E1	H-1C	RV9	D-3C
E2	J-1C	RV10	D-2C
E3	C-2C	RV11	E-2C
E4	G-1C	RV12	D-2C
FL1	C-4C	TP1	H-7C
FL2	C-4C	TP2	I-7C
FL3	B-1C	TP3	I-7C
FL4	F-5C	TP4	I-3C
FL5	E-1C	TP5	J-3C
		TP6	A-5C
IC1	J-2C	TP7	D-6C
IC2	B-3C	TP8	E-3C
IC3	D-3C		
IC4	E-3C		
IC5	F-3C		
Q1	G-7S		
Q2	H-7S		
Q3	H-7S		
Q4	J-5S		
Q5	J-5S		
Q6	I-5S		
Q7	I-4S		
Q8	I-3S		
Q9	I-2S		
Q10	K-7S		
Q11	K-7S		
Q12	K-5S		
Q13	J-5S		
Q14	K-5S		
Q15	K-4S		
Q16	J-3S		
Q17	J-2S		
Q18	B-5S		
Q19	B-4S		
Q20	A-4S		
Q21	B-4S		
Q22	B-3S		
Q23	A-4S		
Q24	E-5S		
Q25	E-5S		
Q26	F-1S		
Q27	C-1S		
RP1	I-6C		
RP2	K-6C		

MD-54 BOARD
CAM-TEST SIGNAL SELECTOR
RF-Y DRIVER
MD-55 BOARD
R-Y SIGNAL GEN
B-Y SIGNAL GEN
RF-CHROMA SIGNAL DRIVER



CHANGE INFORMATION MARK	ADDRESS	REF NO.	DESCRIPTION	EFFECTIVE SER NO.
★1	C-6	IC5/MD-54	TC4053BF TC4053BFNB	10001~ EXC 30011~ LX 40001~ EXC
★2	E-6	C16/MD-54	12P ⟶ 4.7P	10941~ EXC 30934~ LX 40171~ EXC
★3	C-9	CV14/MD-54	43D ⟶ 10P	
★4	C-3 C-4 C-5	IC1/MD-54	TC4072BF MC14072BF	10091~ EXC 30171~ LX 40372~ EXC
	C-3 C-4 E-6	IC5/MD-54	TC4066BF MC14066UBF	
	C-5	IC6/MD-54	TC4053BFNB MC14053BF	



MD-54 BOARD
MD-55 BOARD
CA-55 (UC, J)
CA-55P (EK)

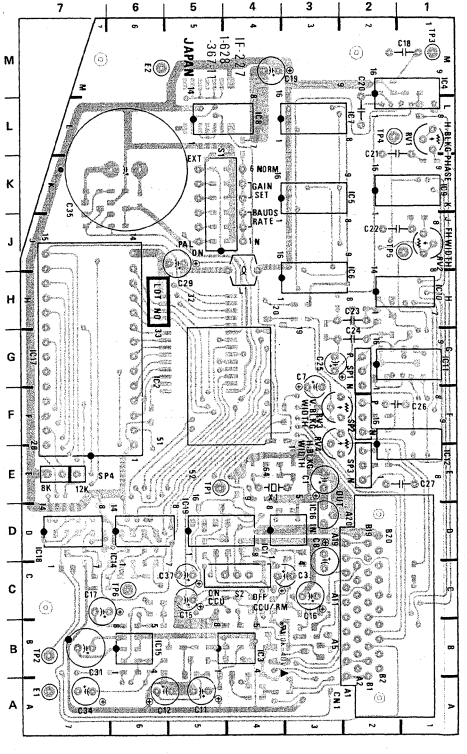
IF-227 BOARD

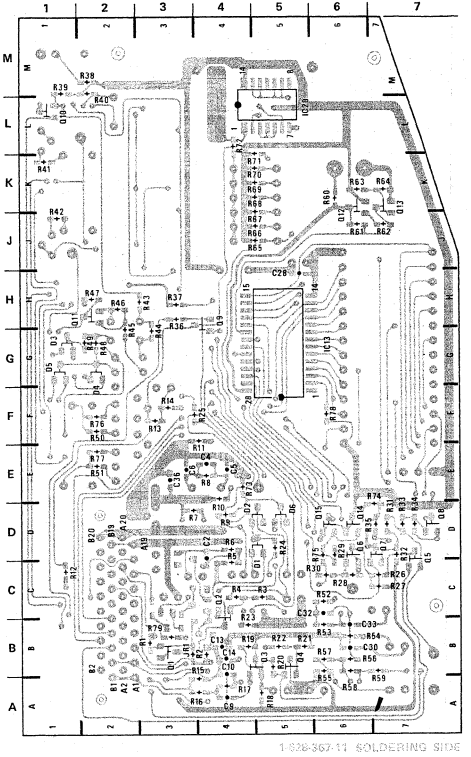
SER NO. 10001-10040 (UC)
30001-30015 (J)
40001-40120 (EK)

SER NO. 100
300
401

IF-227 (1-628-367-11)

CN1	B-2C	SP1	G-2C
		SP2	F-2C
D1	D-5S	SP3	E-2C
D2	D-5S	SP4	E-7C
D3	G-1S		
D4	G-2S	TP1	E-5C
D5	G-1S	TP2	B-7C
D6	D-5S	TP3	M-1C
		TP4	L-2C
E1	A-7C	TP5	J-1C
E2	M-6C	TP6	C-6C
IC1	D-5C	X1	E-4C
IC2	G-4C		
IC3	B-4C		
IC4	M-1C		
IC5	K-3C		
IC6	H-3C		
IC7	L-3C		
IC8	I-4C		
IC9	K-1C		
IC10	H-1C		
IC11	G-1C		
IC12	B-1C		
IC13	G-5S		
IC14	D-6C		
IC15	B-6C		
IC16	D-3C		
IC17	G-7C		
IC18	D-7C		
IC19	D-5C		
IC20	L-5S		
Q1	B-3S		
Q2	C-4S		
Q3	B-4S		
Q4	B-5S		
Q5	D-7S		
Q6	D-6S		
Q7	D-7S		
Q8	D-7S		
Q9	H-4S		
Q10	L-1S		
Q11	H-2S		
Q12	K-6S		
Q13	K-7S		
Q14	D-6S		
Q15	D-6S		
RV1	L-1C		
RV2	J-1C		
RV3	F-3C		
RV4	E-3C		
S1	K-5C		
S2	C-4C		





IF-227 (1-628-367-11)

CN1	B-2C	SP1	G-2C
		SP2	F-2C
D1	D-5S	SP3	E-2C
D2	D-5S	SP4	E-7C
D3	G-1S		
D4	G-2S	TP1	E-5C
D5	G-1S	TP2	B-7C
D6	D-5S	TP3	M-1C
		TP4	L-2C
E1	A-7C	TP5	J-1C
E2	M-6C	TP6	C-6C
IC1	D-5C	X1	E-4C
IC2	G-4C		
IC3	B-4C		
IC4	M-1C		
IC5	K-3C		
IC6	H-3C		
IC7	L-3C		
IC8	I-4C		
IC9	K-1C		
IC10	H-1C		
IC11	G-1C		
IC12	E-1C		
IC13	G-5S		
IC14	D-6C		
IC15	B-6C		
IC16	D-3C		
IC17	G-7C		
IC18	D-7C		
IC19	D-5C		
IC20	L-5S		
Q1	B-3S		
Q2	C-4S		
Q3	B-4S		
Q4	B-5S		
Q5	D-7S		
Q6	D-6S		
Q7	D-7S		
Q8	D-7S		
Q9	H-4S		
Q10	L-1S		
Q11	H-2S		
Q12	K-6S		
Q13	K-7S		
Q14	D-6S		
Q15	D-6S		
RV1	L-1C		
RV2	J-1C		
RV3	F-3C		
RV4	E-3C		
S1	K-5C		
S2	C-4C		

IF-227 (1-628-367-12)

CN1	B-2C	SP1	
		SP2	
D1	D-5S	SP3	
D2	D-5S	SP4	
D3	G-1S		
D4	G-2S	TP1	
D5	G-1S	TP2	
D6	D-5S	TP3	
		TP4	
E1	A-7C	TP5	
E2	M-6C	TP6	
		TP7	
IC1	D-5C		
IC2	G-4C	X1	
IC3	B-4C		
IC4	M-1C		
IC5	K-3C		
IC6	H-3C		
IC7	L-3C		
IC8	L-4C		
IC9	K-1C		
IC10	H-1C		
IC11	G-1C		
IC12	E-1C		
IC13	G-5S		
IC14	D-6C		
IC15	B-6C		
IC16	D-3C		
IC17	G-7C		
IC18	D-7C		
IC19	D-5C		
IC20	L-5S		
Q1	B-3S		
Q2	C-4S		
Q3	B-4S		
Q4	B-5S		
Q5	D-7S		
Q6	D-6S		
Q7	D-7S		
Q8	D-7S		
Q9	H-4S		
Q10	L-1S		
Q11	H-2S		
Q12	K-6S		
Q13	K-7S		
Q14	D-6S		
Q15	D-6S		
RV1	L-1C		
RV2	J-1C		
RV3	F-3C		
RV4	E-3C		
S1	K-5C		
S2	C-4C		

S2B-CA55-IF227MOUNT

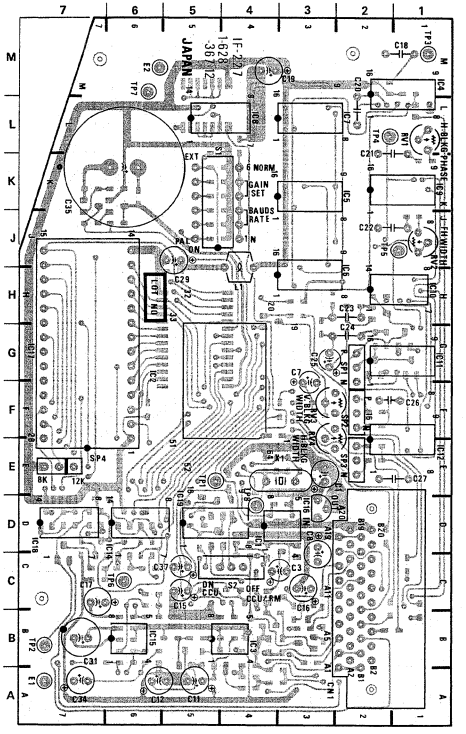
SER NO. 10041- (UC)
30016- (J)
40121- (EK)

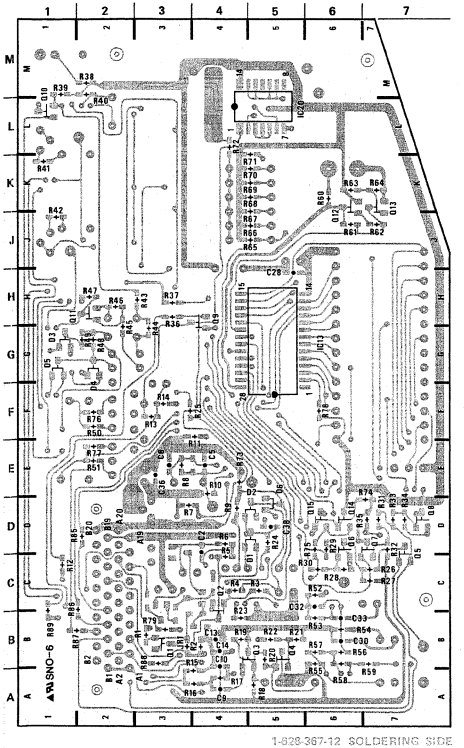
67-11)

SP1	G-2C	
SP2	F-2C	
SP3	E-2C	
SP4	E-7C	
TP1	E-5C	
TP2	B-7C	
TP3	M-1C	
TP4	L-2C	
TP5	J-1C	
TP6	C-6C	
X1	E-4C	

IF-227 (1-628-367-12)

CN1	B-2C		
D1	D-5S		
D2	D-5S		
D3	G-1S		
D4	G-2S		
D5	G-1S		
D6	D-5S		
E1	A-7C		
E2	M-6C		
IC1	D-5C		
IC2	G-4C		
IC3	B-4C		
IC4	M-1C		
IC5	K-3C		
IC6	H-3C		
IC7	L-3C		
IC8	L-4C		
IC9	K-1C		
IC10	H-1C		
IC11	G-1C		
IC12	E-1C		
IC13	G-5S		
IC14	D-6C		
IC15	B-6C		
IC16	D-3C		
IC17	G-7C		
IC18	D-7C		
IC19	D-5C		
IC20	L-5S		
Q1	B-3S		
Q2	C-4S		
Q3	H-4S		
Q4	B-5S		
Q5	D-7S		
Q6	D-6S		
Q7	D-7S		
Q8	D-7S		
Q9	H-4S		
Q10	L-1S		
Q11	H-2S		
Q12	K-6S		
Q13	K-7S		
Q14	D-6S		
Q15	D-6S		
RV1	L-1C		
RV2	J-1C		
RV3	F-3C		
RV4	E-3C		
S1	K-5C		
S2	C-4C		

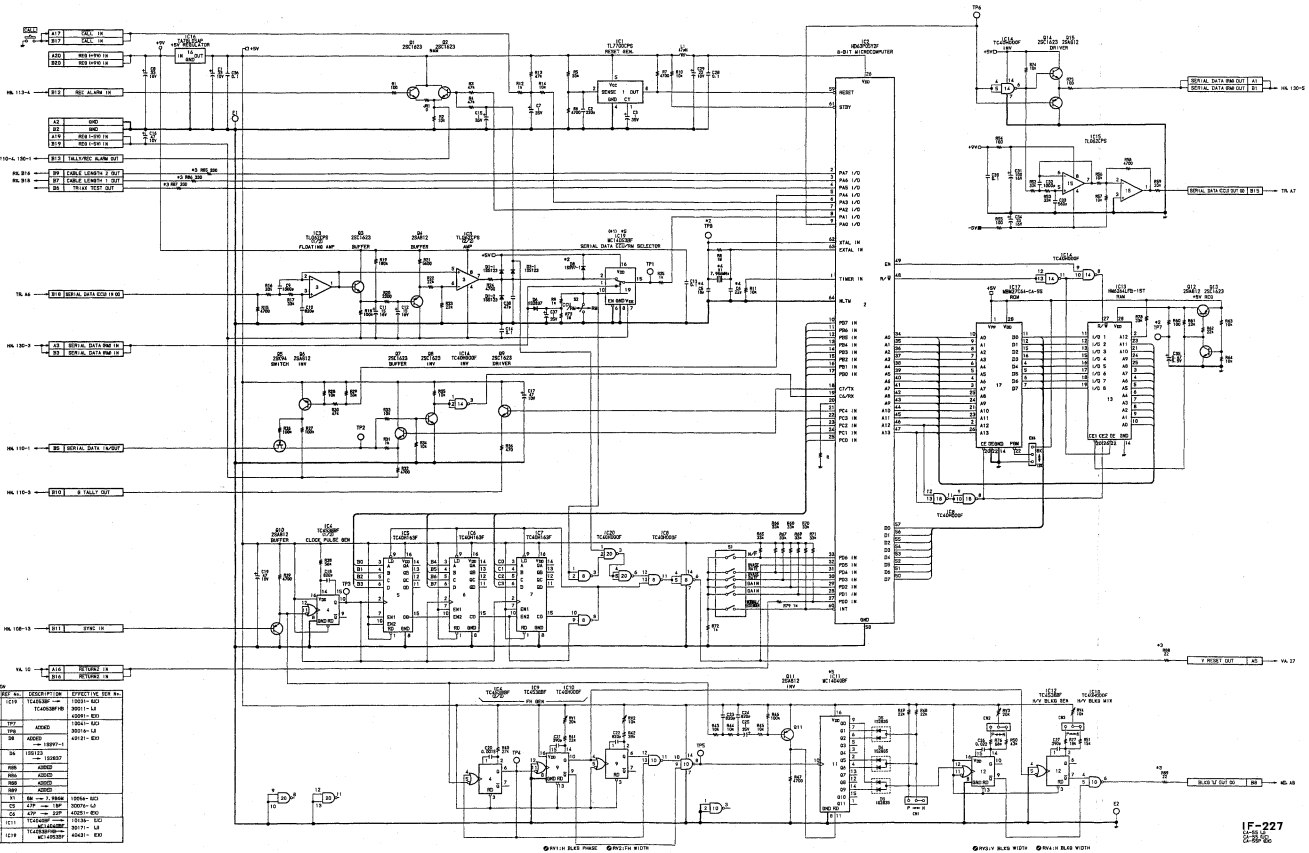




IF-227 (1-628-367-12)

CN1	B-2C		
D1	D-5S		
D2	D-5S		
D3	G-1S		
D4	G-2S		
D5	G-1S		
D6	D-5S		
E1	A-7C		
E2	M-6C		
IC1	D-5C		
IC2	G-4C		
IC3	B-4C		
IC4	M-1C		
IC5	K-3C		
IC6	H-3C		
IC7	L-3C		
IC8	L-4C		
IC9	K-1C		
IC10	H-1C		
IC11	G-1C		
IC12	E-1C		
IC13	G-5S		
IC14	D-6C		
IC15	B-6C		
IC16	D-3C		
IC17	G-7C		
IC18	D-7C		
IC19	D-5C		
IC20	L-5S		
Q1	B-3S		
Q2	C-4S		
Q3	H-4S		
Q4	B-5S		
Q5	D-7S		
Q6	D-6S		
Q7	D-7S		
Q8	D-7S		
Q9	H-4S		
Q10	L-1S		
Q11	H-2S		
Q12	K-6S		
Q13	K-7S		
Q14	D-6S		
Q15	D-6S		
RV1	L-1C		
RV2	J-1C		
RV3	F-3C		
RV4	E-3C		
S1	K-5C		
S2	C-4C		
SP1	G-2C		
SP2	F-2C		
SP3	E-2C		
SP4	E-7C		
TP1	E-5C		
TP2	B-7C		
TP3	M-1C		
TP4	L-2C		
TP5	J-1C		
TP6	C-6C		
TP7	M-6C		
X1	E-4C		

7 BOARD



CHANGE INFORMATION				
MARK	ADDRESS	REF No.	DESCRIPTION	EFFECTIVE SER No.
#1	D-3	1D19	TC4053BF → TC4053BF-HB	10031~ (UC) 30011~ (J) 40091~ (EK)
#2	F-3	1P7	ADDED	10041~ (UC) 30019~ (J) 40121~ (EK)
	D-3	3B	ADDED → 10097~	
#3	C-3	3A	105123 → 10097	
	B-2	R65	430KΩ	
	B-3	R64	430KΩ	
	F-5	R69	430KΩ	
	F-6	R67	430KΩ	
#4	D-3	X1	6M → 7.9968	10054~ (UC) 30074~ (J) 40025~ (EK)
		C5	47P → 39P	
		C6	47P → 33P	
#5	B-1C	1C11	TC4024BF → MC14024BF	10139~ (UC) 30171~ (J) 40431~ (EK)
	B-3C	1D19	TC4053BF → MC14053BF	

C-25 C-26

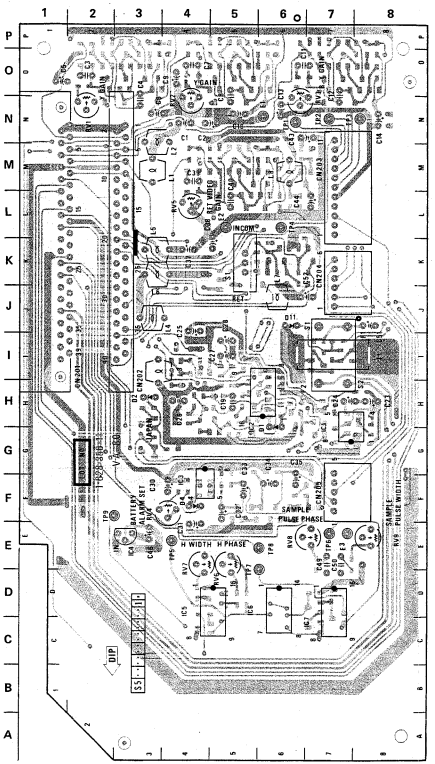
A B C D E F

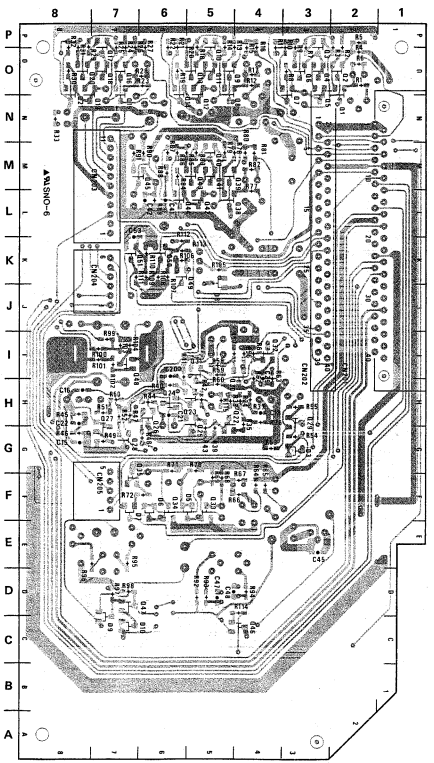
VA-80 BOARD

SER NO. 10001-10040 (UC)
30001-30015 (J)
40001-40120 (EK)

VA-80 (1-628-356-11)

CN201	I-1C	Q21	N-8S
	I-1S	Q22	H-5S
CN202	I-3C	Q23	H-5S
	I-3S	Q24	H-6S
CN203	M-7C	Q25	H-5S
	M-7S	Q26	H-6S
CN204	K-7C	Q27	H-7S
	K-7S	Q28	G-7S
CN205	F-7C	Q29	H-3S
	F-7S	Q30	I-4S
		Q31	I-5S
D1	G-6C	Q32	I-4S
D2	H-3C	Q33	F-5S
D3	G-3S	Q34	F-6S
D4	F-4C	Q35	F-7S
D5	F-5S	Q38	L-5S
D6	F-6S	Q39	M-5S
D7	F-7S	Q40	M-5S
D8	K-5S	Q41	M-5S
D9	C-7S	Q42	L-5S
D10	C-7S	Q43	M-5S
D11	J-6C	Q44	L-6S
		Q45	M-6S
E1	N-6C	Q46	C-4S
E2	L-5C	Q47	D-7S
E3	E-7C	Q48	I-7S
		Q49	K-6S
IC1	G-7C	Q50	K-6S
IC2	H-6C	Q51	K-7S
IC3	F-4C		
IC4	E-3C	RV1	N-2C
IC5	D-5C	RV2	N-4C
IC6	D-6C	RV3	N-6C
IC7	D-7C	RV4	F-4C
		RV5	L-4C
Q1	N-1S	RV6	E-5C
Q2	O-2S	RV7	E-4C
Q3	O-3S	RV8	E-7C
Q4	O-3S	RV9	E-8C
Q5	N-3S		
Q6	O-3S	S1	K-5C
Q7	N-3S		
Q8	N-5S	TP1	N-6C
Q9	O-5S	TP2	N-7C
Q10	O-5S	TP3	N-8C
Q11	O-5S	TP4	L-6C
Q12	N-5S	TP5	E-4C
Q13	O-5S	TP6	E-7C
Q14	N-6S	TP7	E-6C
Q15	N-7S	TP8	E-6C
Q16	O-7S	TP9	F-3C
Q17	O-7S		
Q18	O-7S		
Q19	N-7S		
Q20	O-8S		





1-628-356-11 SOLDERING SIDE

VA-80 (1-628-356-11)

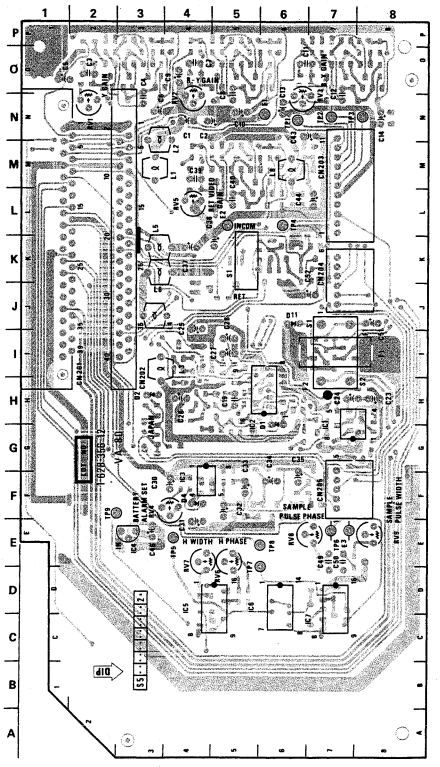
CN201	I-1C	Q21	N-8S
	I-1S	Q22	H-5S
CN202	I-3C	Q23	H-5S
	I-3S	Q24	H-6S
CN203	M-7C	Q25	H-5S
	M-7S	Q26	H-6S
CN204	K-7C	Q27	H-7S
	K-7S	Q28	G-7S
CN205	F-7C	Q29	H-3S
	F-7S	Q30	I-4S
		Q31	I-5S
D1	G-6C	Q32	I-4S
D2	H-3C	Q33	F-5S
D3	G-3S	Q34	F-6S
D4	F-4C	Q35	F-7S
D5	F-5S	Q38	L-5S
D6	F-6S	Q39	M-5S
D7	F-7S	Q40	M-5S
D8	K-5S	Q41	M-5S
D9	C-7S	Q42	L-5S
D10	C-7S	Q43	M-5S
D11	J-6C	Q44	L-6S
		Q45	M-6S
E1	N-6C	Q46	C-4S
E2	L-5C	Q47	D-7S
E3	E-7C	Q48	I-7S
		Q49	K-6S
IC1	G-7C	Q50	K-6S
IC2	H-6C	Q51	K-7S
IC3	F-4C		
IC4	E-3C	RV1	N-2C
IC5	D-5C	RV2	N-4C
IC6	D-6C	RV3	N-6C
IC7	D-7C	RV4	F-4C
		RV5	L-4C
Q1	N-1S	RV6	E-5C
Q2	O-2S	RV7	E-4C
Q3	O-3S	RV8	E-7C
Q4	O-3S	RV9	E-8C
Q5	N-3S		
Q6	O-3S	S1	K-5C
Q7	N-3S		
Q8	N-5S	TP1	N-6C
Q9	O-5S	TP2	N-7C
Q10	O-5S	TP3	N-8C
Q11	O-5S	TP4	L-6C
Q12	N-5S	TP5	E-4C
Q13	O-5S	TP6	E-7C
Q14	N-6S	TP7	E-6C
Q15	N-7S	TP8	E-6C
Q16	O-7S	TP9	F-3C
Q17	O-7S		
Q18	O-7S		
Q19	N-7S		
Q20	O-8S		

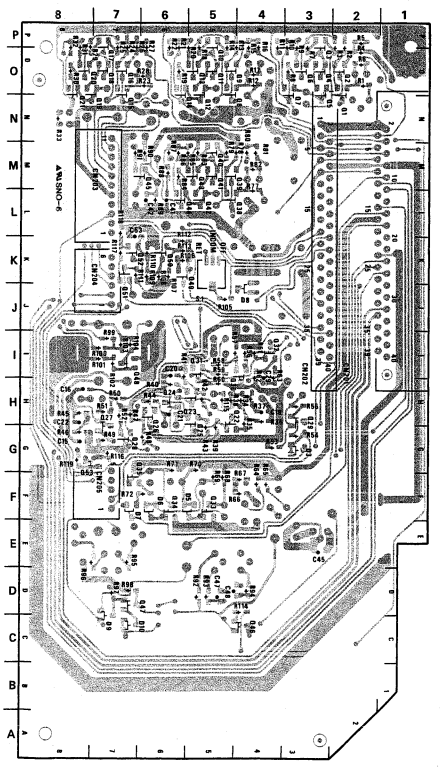
VA-80 BOARD

SER NO.		
10041-		(UC)
30016-		(J)
40121-		(EK)

VA-80 (1-628-356-12)

CN201	I-1C	Q21	N-8S
	I-1S	Q22	H-5S
CN202	I-3C	Q23	H-5S
	I-3S	Q24	H-6S
CN203	M-7C	Q25	H-5S
	M-7S	Q26	H-6S
CN204	K-7C	Q27	H-7S
	K-7S	Q28	G-7S
CN205	F-7C	Q29	H-3S
	F-7S	Q30	I-4S
		Q31	I-5S
D1	G-6C	Q32	I-4S
D2	H-3C	Q33	F-5S
D3	G-3S	Q34	F-6S
D4	F-4C	Q35	F-7S
D5	F-5S	Q38	L-5S
D6	F-6S	Q39	M-5S
D7	F-7S	Q40	M-5S
D8	K-5S	Q41	M-5S
D9	C-7S	Q42	L-5S
D10	C-7S	Q43	M-5S
D11	J-6C	Q44	L-6S
		Q45	M-6S
E1	N-6C	Q46	C-4S
E2	L-5C	Q47	D-7S
E3	E-7C	Q48	I-7S
		Q49	K-6S
IC1	G-7C	Q50	K-6S
IC2	H-6C	Q51	K-7S
IC3	F-4C	Q52	K-5S
IC4	E-3C	Q53	G-8S
IC5	D-5C		
IC6	D-6C	RV1	N-2C
IC7	D-7C	RV2	N-4C
		RV3	N-6C
Q1	N-2S	RV4	F-4C
Q2	O-2S	RV5	L-4C
Q3	O-3S	RV6	E-5C
Q4	O-3S	RV7	E-4C
Q5	N-3S	RV8	E-7C
Q6	O-3S	RV9	E-8C
Q7	N-3S		
Q8	N-5S	S1	K-5C
Q9	O-5S		K-5S
Q10	O-5S		
Q11	O-5S	TP1	N-6C
Q12	N-5S	TP2	N-7C
Q13	O-5S	TP3	N-8C
Q14	N-6S	TP4	L-6C
Q15	N-7S	TP5	E-4C
Q16	O-7S	TP6	E-7C
Q17	O-7S	TP7	E-6C
Q18	O-7S	TP8	E-6C
Q19	N-7S	TP9	F-3C
Q20	O-8S		





1-628-356-12 SOLDERING SIDE

VA-80 (1-628-356-12)

CN201	I-1C	Q21	N-8S
	I-1S	Q22	H-5S
CN202	I-3C	Q23	H-5S
	I-3S	Q24	H-6S
CN203	M-7C	Q25	H-5S
	M-7S	Q26	H-6S
CN204	K-7C	Q27	H-7S
	K-7S	Q28	G-7S
CN205	F-7C	Q29	H-3S
	F-7S	Q30	I-4S
		Q31	I-5S
D1	G-6C	Q32	I-4S
D2	H-3C	Q33	F-5S
D3	G-3S	Q34	F-6S
D4	F-4C	Q35	F-7S
D5	F-5S	Q38	L-5S
D6	F-6S	Q39	M-5S
D7	F-7S	Q40	M-5S
D8	K-5S	Q41	M-5S
D9	C-7S	Q42	L-5S
D10	C-7S	Q43	M-5S
D11	J-6C	Q44	L-6S
		Q45	M-6S
E1	N-6C	Q46	C-4S
E2	L-5C	Q47	D-7S
E3	E-7C	Q48	I-7S
		Q49	K-6S
IC1	G-7C	Q50	K-6S
IC2	H-6C	Q51	K-7S
IC3	F-4C	Q52	K-5S
IC4	E-3C	Q53	G-8S
IC5	D-5C		
IC6	D-6C	RV1	N-2C
IC7	D-7C	RV2	N-4C
		RV3	N-6C
Q1	N-2S	RV4	F-4C
Q2	O-2S	RV5	L-4C
Q3	O-3S	RV6	E-5C
Q4	O-3S	RV7	E-4C
Q5	N-3S	RV8	E-7C
Q6	O-3S	RV9	E-8C
Q7	N-3S		
Q8	N-5S	S1	K-5C
Q9	O-5S		K-5S
Q10	O-5S		
Q11	O-5S	TP1	N-6C
Q12	N-5S	TP2	N-7C
Q13	O-5S	TP3	N-8C
Q14	N-6S	TP4	L-6C
Q15	N-7S	TP5	E-4C
Q16	O-7S	TP6	E-7C
Q17	O-7S	TP7	E-6C
Q18	O-7S	TP8	E-6C
Q19	N-7S	TP9	F-3C
Q20	O-8S		

A-20 BOARD

E: VIDEO, INCOM GEN
BATTERY ALARM GEN
SAMPLE PULSE GEN
EARPHONE DRIVER
R-Y, B-Y AMP
SYNC AMP
RET VIDEO AMP

* NOTE

*MARK	ADDRESS	REF NO.	DESCRIPTION	
*1	D-3	IC3	TC4053BF → TC4053BFNB	30311- L3 40561- IDO
	F-5	R111	22K→1.7K 3.3K → 1K	10311- MKO 30511- L3 40511- IDO
	E-5	VR3	ADD → 2SC1623	10041- MKO 30516- L3
	C-3	VR6	ADD → 2SA812	40121- IDO
	C-5	R116	ADD → 820Ω	
	F-5	R117,118	ADD → 10Ω	
	E-3	R119	ADD → 47	

*MARK	ADDRESS	REF NO.	DESCRIPTION	EFFECTIVE SER NO
*2	E-5	R109	180K → 220K	10541- MKO
	F-5	D13	ADD → (1SS97-)	30016- L2
	E-5	R110	DELETE	40121- IDO
	E-5	R109	180K → 22K	
*3	H-5	IC2	TC4053BFNB → MC14053BF	10134- MKO 30171- L2 40431- IDO

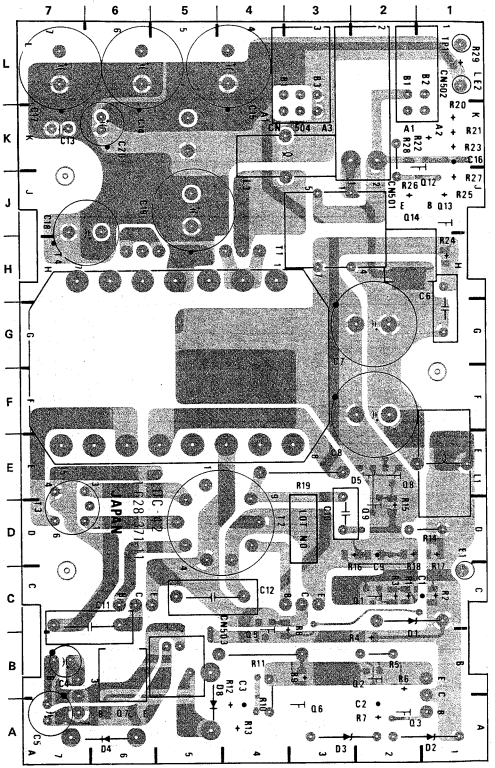
VA-80
CA-55 (J)
CA-55 (UC)
CA-55P (EK)

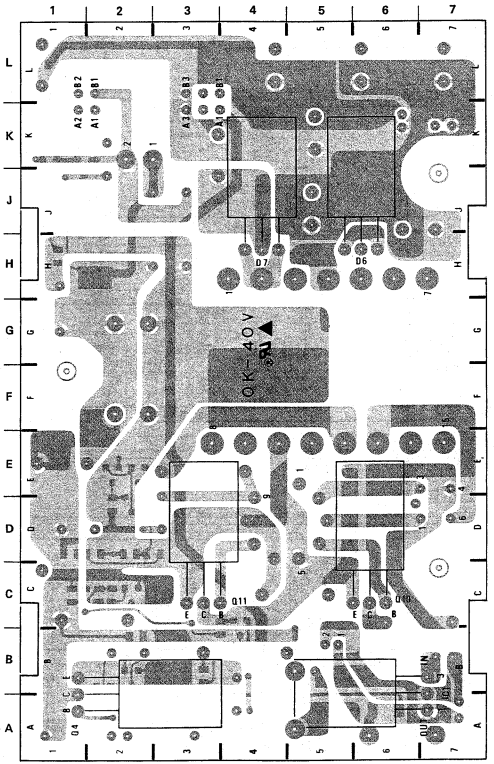
DC-42 BOARD

SER NO. 10001-10040 (UC)
30001-30015 (J)
40001-40120 (EK)

DC-42 (1-628-371-11)

CN501	K-2C
CN502	L-1C
CN503	B-5C
CN504	L-3C
D1	C-2C
D2	A-1C
D3	A-3C
D4	A-6C
D5	E-2C
D6	J-6S
D7	A-6C
	J-4S
D8	A-5C
E1	C-1C
E2	L-1C
IC1	A-5S
Q1	C-2C
Q2	B-2C
Q3	A-2C
Q4	A-3S
Q5	B-4C
Q6	A-3C
Q8	E-2C
Q9	D-2C
Q10	D-6S
Q11	D-3S
Q12	J-1C
Q13	J-1C
Q14	J-2C
T1	J-3C
T2	D-4C
T3	D-7C
T4	G-6C
TP1	C-1C





1-628-371-11 SOLDERING SIDE

DC-42 (1-628-371-11)

CN501	K-2C
CN502	L-1C
CN503	B-5C
CN504	L-3C
D1	C-2C
D2	A-1C
D3	A-3C
D4	A-6C
D5	E-2C
D6	J-6S
D7	A-6C
	J-4S
D8	A-5C
E1	C-1C
E2	L-1C
IC1	A-5S
Q1	C-2C
Q2	B-2C
Q3	A-2C
Q4	A-3S
Q5	B-4C
Q6	A-3C
Q8	E-2C
Q9	D-2C
Q10	D-6S
Q11	D-3S
Q12	J-1C
Q13	J-1C
Q14	J-2C
T1	J-3C
T2	D-4C
T3	D-7C
T4	G-6C
TP1	C-1C

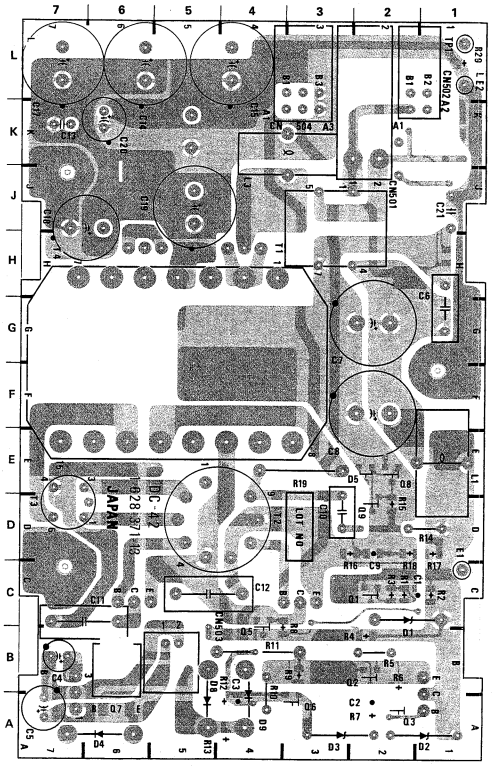
**

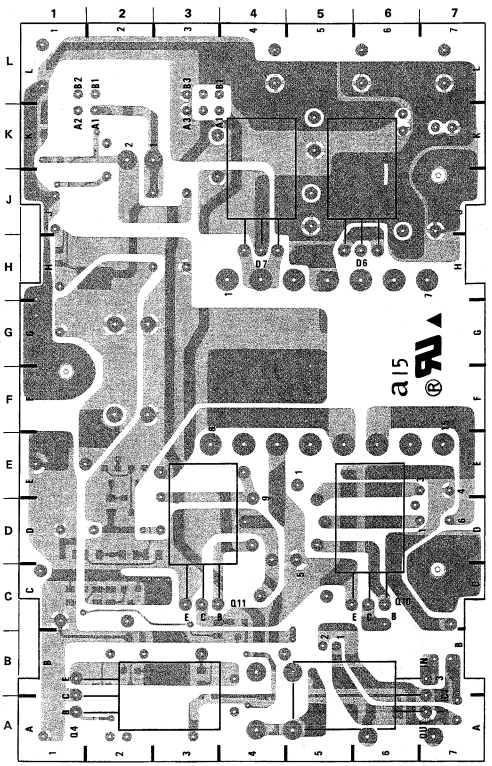
DC-42 BOARD

SER NO.		
10046-		(UC)
30056-		(J)
40221-		(EK)

DC-42 (1-628-371-13)

CN501	K-2C
CN502	L-1C
CN503	B-5C
CN504	L-3C
D1	C-2C
D2	A-1C
D3	A-3C
D4	A-6C
D5	E-2C
D6	J-6S
D7	J-4S
D8	A-5C
D9	A-4C
E1	C-1C
E2	L-1C
IC1	A-6S
Q1	C-2C
Q2	B-2C
Q3	A-2C
Q4	A-2S
Q5	B-4C
Q6	A-3C
Q7	B-6C
Q8	E-2C
Q9	D-2C
Q10	D-6S
Q11	D-3S
T1	J-3C
T2	D-4C
T3	D-7C
T4	G-5C
TP1	L-1C





DC-42 (1-628-371-13)

CN501	K-2C
CN502	L-1C
CN503	B-5C
CN504	L-3C
D1	C-2C
D2	A-1C
D3	A-3C
D4	A-6C
D5	E-2C
D6	J-6S
D7	J-4S
D8	A-5C
D9	A-4C
E1	C-1C
E2	L-1C
IC1	A-6S
Q1	C-2C
Q2	B-2C
Q3	A-2C
Q4	A-2S
Q5	B-4C
Q6	A-3C
Q7	B-6C
Q8	E-2C
Q9	D-2C
Q10	D-6S
Q11	D-3S
T1	J-3C
T2	D-4C
T3	D-7C
T4	G-5C
TP1	L-1C

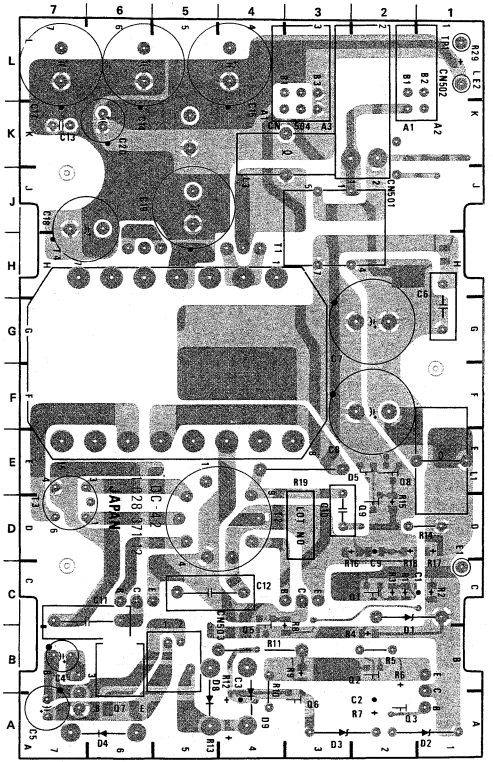
**

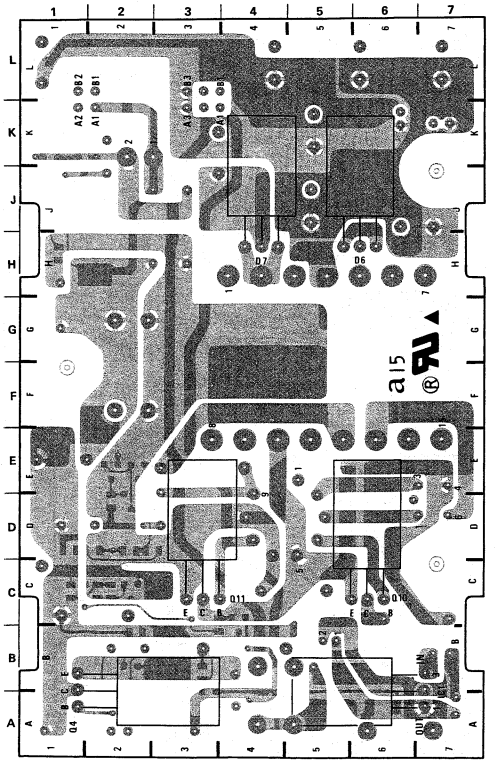
SER NO. 10041-10045 (UC)
30016-30055 (J)
40121-40220 (EK)

DC-42 BOARD

DC-42 (1-628-371-12)

CN501	K-2C
CN502	L-1C
CN503	B-5C
CN504	L-3C
D1	C-2C
D2	A-1C
D3	A-3C
D4	A-6C
D5	B-2C
D6	J-6S
D7	J-4S
D8	A-5C
D9	A-4C
E1	C-1C
E2	L-1C
IC1	A-5S
Q1	C-2C
Q2	B-2C
Q3	A-2C
Q4	A-1S
Q5	B-4C
Q6	A-3C
Q7	A-6C
Q8	B-2C
Q9	D-2C
Q10	D-6S
Q11	D-3S
T1	J-3C
T2	D-4C
T3	D-7C
T4	J-7C
TP1	L-1C





1-628-371-12 SOLDERING SIDE

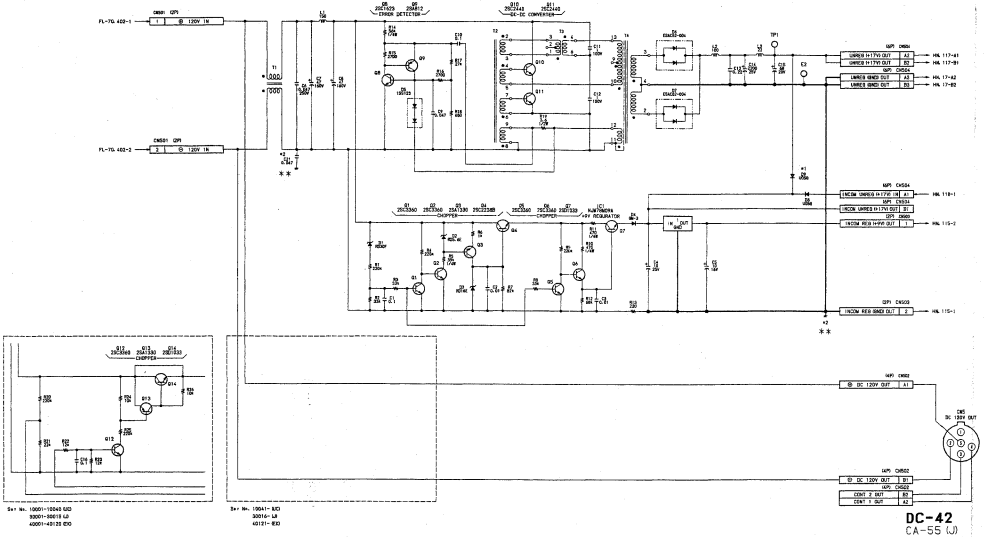
DC-42 (1-628-371-12)

CN501	K-2C
CN502	L-1C
CN503	B-5C
CN504	L-3C
D1	C-2C
D2	A-1C
D3	A-3C
D4	A-6C
D5	B-2C
D6	J-6S
D7	J-4S
D8	A-5C
D9	A-4C
E1	C-1C
E2	L-1C
IC1	A-5S
Q1	C-2C
Q2	B-2C
Q3	A-2C
Q4	A-1S
Q5	B-4C
Q6	A-3C
Q7	A-6C
Q8	B-2C
Q9	D-2C
Q10	D-6S
Q11	D-3S
T1	J-3C
T2	D-4C
T3	D-7C
T4	J-7C
TP1	L-1C

DC-42 BOARD
C CONVERTER

REMARK INFORMATION

MARK	ADDRESS	REF No.	DESCRIPTION	EFFECTIVE SER No.
*1	C-3	D9	ADDED	10041- MD 30016- LB 40121- EKD
*2	C-3	C31	ADDED 0.047	
	C-4	⏚	ADDED	



C-33

C-34

CA-55 (UC)1-R2
CA-55 (J)1-R2
CA-55P (EK)1-R2

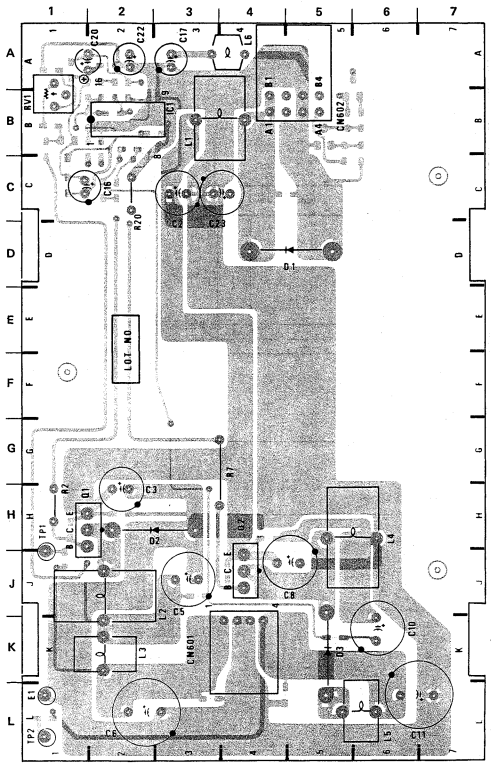
B-CA55-DC42MS3

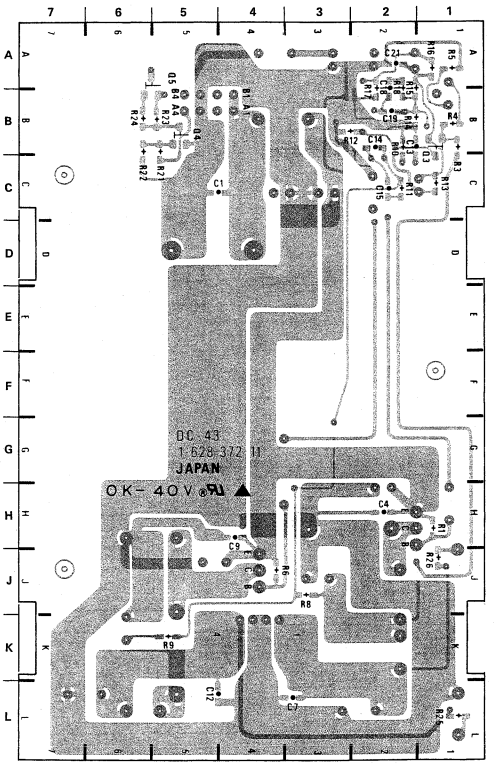
SER NO. 10001-10040 (UC)
30001-30015 (J)
40001-40120 (EK)

DC-43 BOARD

DC-43 (1-628-372-11)

CN601	K-4C
CN602	A-5C
D1	D-5C
D2	H-3C
D3	K-3C
E1	L-1C
IC1	B-2C
Q1	H-2C
Q2	J-4C
Q3	B-1S
Q4	B-5S
Q5	A-5S
RV1	B-1C
TP1	J-1C
TP2	L-1C





1-628-372-11 SOLDERING SIDE

DC-43 (1-628-372-11)

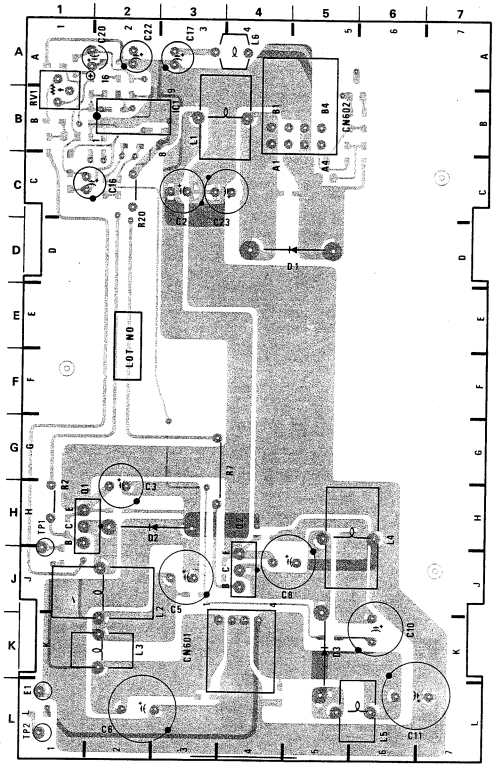
CN601	K-4C
CN602	A-5C
D1	D-5C
D2	H-3C
D3	K-3C
E1	L-1C
IC1	B-2C
Q1	H-2C
Q2	J-4C
Q3	B-1S
Q4	B-5S
Q5	A-5S
RV1	B-1C
TP1	J-1C
TP2	L-1C

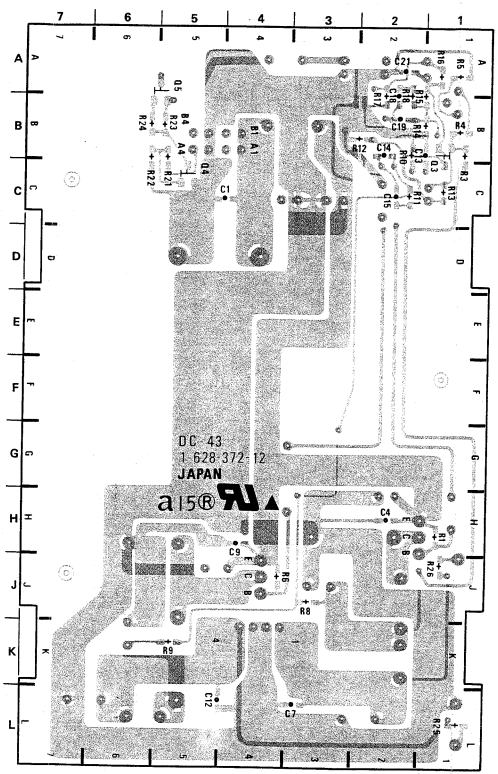
DC-43 BOARD

SER NO. 10041- (UC)
30016- (J)
40121- (EK)

DC-43 (1-628-372-12)

CN601	K-4C
CN602	B-5C
D1	D-5C
D2	H-3C
D3	K-5C
E1	L-1C
IC1	B-2C
Q1	H-2C
Q2	J-4C
Q3	B-1S
Q4	C-5S
Q5	A-5S
RV1	B-1C
TP1	J-1C
TP2	L-1C



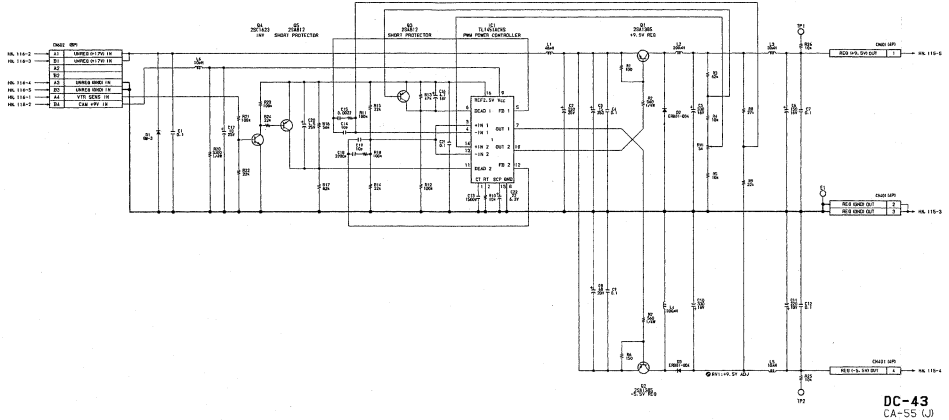


1-628-372-12 SOLDERING SIDE

DC-43 (1-628-372-12)

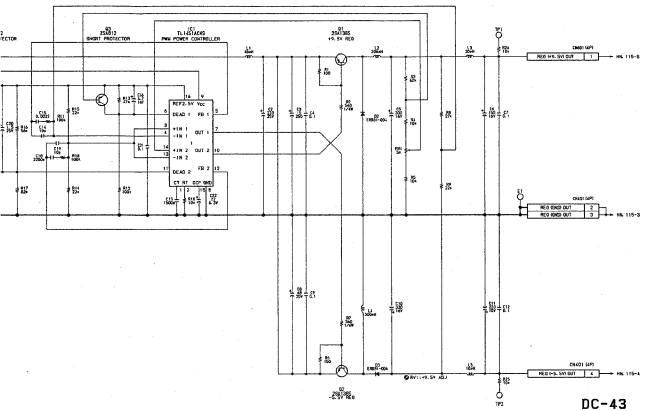
CN601	K-4C
CN602	B-5C
D1	D-5C
D2	H-3C
D3	K-5C
E1	L-1C
IC1	B-2C
Q1	H-2C
Q2	J-4C
Q3	B-1S
Q4	C-5S
Q5	A-5S
RV1	B-1C
TP1	J-1C
TP2	L-1C

DC-43 BOARD
SWITCHING REGULATOR



DC-43
CA-55 (J)
CA-55 (UC)
CA-55 (EK)

DC-43



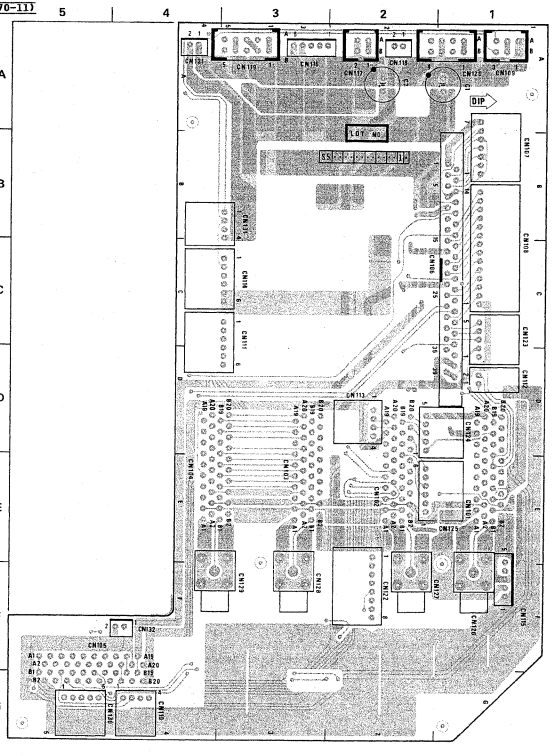
DC-43
CA-55 (J)
CA-55 (JC)
CA-55 (EK)

SER NO. 10001-10040 (UC)
30001-30015 (J)
40001-40120 (EK)

HN-106 BOARD

HN-106 (1-628-370-11)

CN101	D-1C
	E-1S
CN102	D-2C
	E-2S
CN103	D-3C
	E-3S
CN104	D-4C
	E-4S
CN105	F-4C
	F-4S
CN106	C-2C
	C-1S
CN107	B-1C
	B-1S
CN108	C-1C
	C-1S
CN109	A-1C
	A-1S
CN110	G-4C
	G-4S
CN111	D-3C
	C-4S
CN112	D-1C
	D-1S
CN113	D-2C
	D-2S
CN114	C-3C
	C-4S
CN115	F-1C
	F-1S
CN116	A-3C
	A-3S
CN117	A-2C
	A-2S
CN118	A-2C
	A-2S
CN119	A-3C
	A-3S
CN120	A-1C
	A-1S
CN121	A-4C
	A-4S
CN122	F-2C
	F-2S
CN123	C-1C
	C-1S
CN124	D-1C
	D-1S
CN125	E-1C
	E-1S
CN126	F-1C
	F-1S
CN127	F-1C
	F-2S
CN128	F-3C
	F-3S
CN129	F-3C
	F-4S
CN130	G-5C
	G-4S
CN131	B-3C
	B-4S
CN132	F-4S



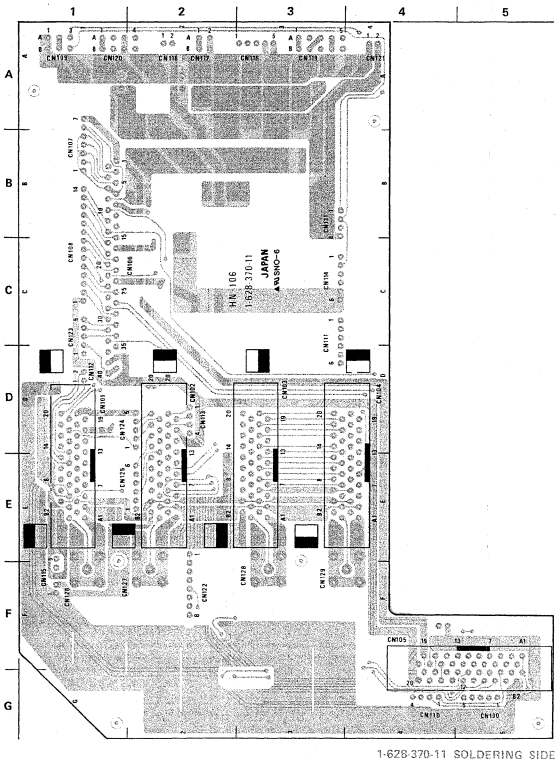
C-40 (e)

SER

FL-70 BOARD

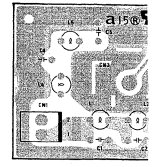
HN-106 (1-628-370-11)

CN101	D-1C
	E-1S
CN102	D-2C
	E-2S
CN103	D-3C
	E-3S
CN104	D-4C
	E-4S
CN105	F-4C
	F-4S
CN106	C-2C
	C-1S
CN107	B-1C
	B-1S
CN108	C-1C
	C-1S
CN109	A-1C
	A-1S
CN110	G-4C
	G-4S
CN111	D-3C
	C-4S
CN112	D-1C
	D-1S
CN113	D-2C
	D-2S
CN114	C-3C
	C-4S
CN115	F-1C
	F-1S
CN116	A-3C
	A-3S
CN117	A-2C
	A-2S
CN118	A-2C
	A-2S
CN119	A-3C
	A-3S
CN120	A-1C
	A-1S
CN121	A-4C
	A-4S
CN122	F-2C
	F-2S
CN123	C-1C
	C-1S
CN124	D-1C
	D-1S
CN125	E-1C
	E-1S
CN126	F-1C
	F-1S
CN127	F-1C
	F-2S
CN128	F-3C
	F-3S
CN129	F-3C
	F-4S
CN130	G-5C
	G-4S
CN131	B-3C
	B-4S
CN132	F-4S

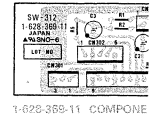


1-628-370-11 SOLDERING SIDE

C-41 (e)



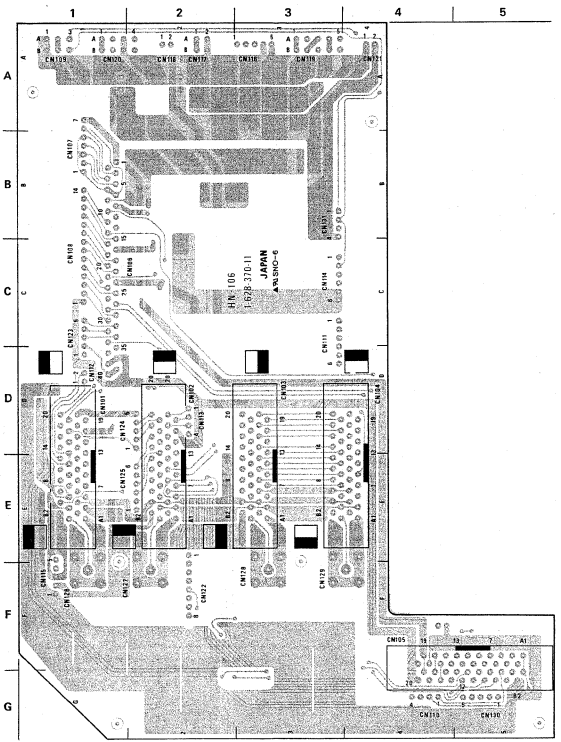
SW-312 BOARD



1-628-369-11 COMPONE

FL-70 BOARD

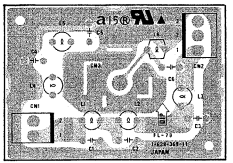
SER NO. 10001-10040 (UC)
30001-30015 (J)
40001-40120 (EK)



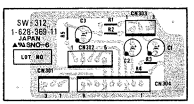
1-628-370-11 SOLDERING SIDE

HN-106 (1-628-370-11)

CN101	D-1C
	E-1S
CN102	D-2C
	E-2S
CN103	D-3C
	E-3S
CN104	D-4C
	E-4S
CN105	F-4C
	F-4S
CN106	C-2C
	C-1S
CN107	B-1C
	B-1S
CN108	C-1C
	C-1S
CN109	A-1C
	A-1S
CN110	G-4C
	G-4S
CN111	D-3C
	C-4S
CN112	D-1C
	D-1S
CN113	D-2C
	D-2S
CN114	C-3C
	C-4S
CN115	F-1C
	F-1S
CN116	A-3C
	A-3S
CN117	A-2C
	A-2S
CN118	A-2C
	A-2S
CN119	A-3C
	A-3S
CN120	A-1C
	A-1S
CN121	A-4C
	A-4S
CN122	F-2C
	F-2S
CN123	C-1C
	C-1S
CN124	D-1C
	D-1S
CN125	E-1C
	E-1S
CN126	F-1C
	F-1S
CN127	F-1C
	F-2S
CN128	F-3C
	F-3S
CN129	F-3C
	F-4S
CN130	G-5C
	G-4S
CN131	B-3C
	B-4S
CN132	F-4S



SW-312 BOARD



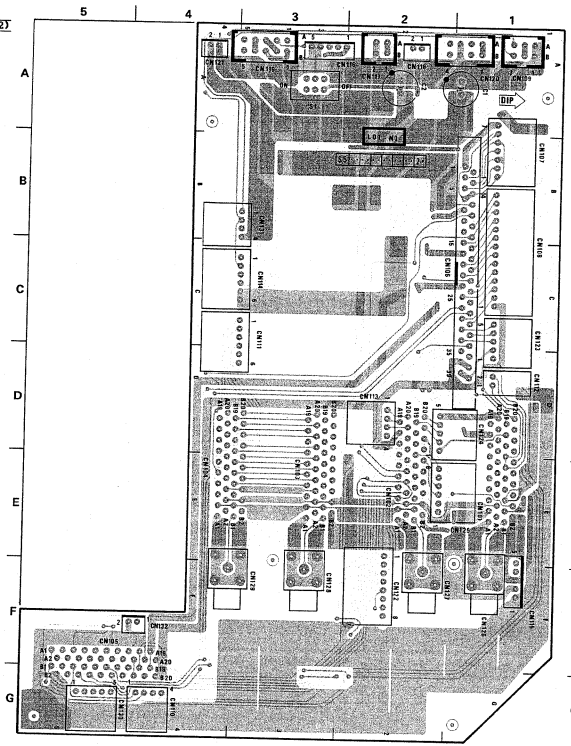
1-628-369-11 COMPONENT SIDE

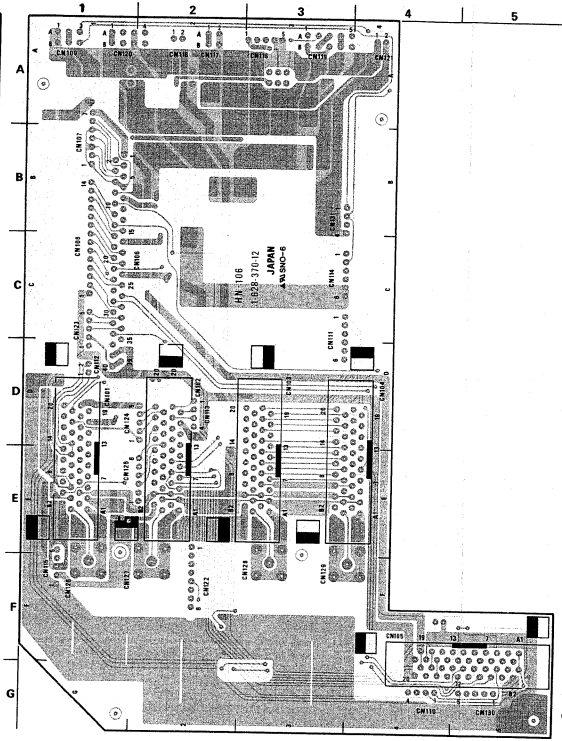
HN-106 BOARD

SER NO.		
10041-		(UC)
30016-		(J)
40121-		(EK)

HN-106 (1-628-370-12)

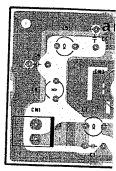
CN101	E-1C
	E-1S
CN102	E-2C
	E-2S
CN103	E-3C
	E-3S
CN104	E-4C
	E-4S
CN105	F-4C
	F-4S
CN106	C-1C
	C-1S
CN107	B-1C
	B-1S
CN108	C-1C
	C-1S
'N109	A-1C
	A-1S
CN110	G-4C
	G-4S
CN111	C-4C
	C-3S
CN112	D-1C
	D-1S
CN113	D-2C
	D-2S
CN114	C-4C
	C-4S
CN115	F-1C
	F-1S
'N116	A-3C
	A-3S
CN117	A-2C
	A-2S
CN118	A-2C
	A-2S
CN119	A-3C
	A-3S
CN120	A-1C
	A-1S
CN121	A-4C
	A-4S
CN122	F-2C
	F-2S
'N123	C-1C
	C-1S
CN124	D-1C
	D-1S
CN125	E-1C
	E-1S
CN126	F-1C
	F-1S
CN127	F-2C
	F-2S
CN128	F-3C
	F-3S
CN129	F-3C
	F-3S
CN130	G-5C
	G-5S
CN131	B-4C
	B-4S
CN132	F-4C



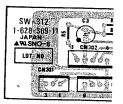


1-628-370-12 SOLDERING SIDE

FL-70 BOARD



SW-312 BOARD



1-628-369-11 COMP

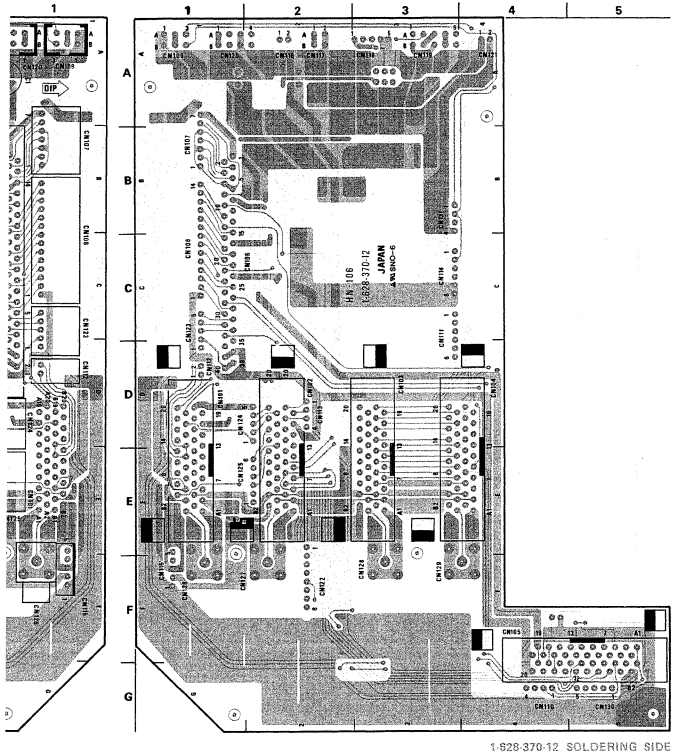
HN-106 (1-628-370-12)

CN101	E-1C
	E-1S
CN102	E-2C
	E-2S
CN103	E-3C
	E-3S
CN104	E-4C
	E-4S
CN105	F-4C
	F-4S
CN106	C-1C
	C-1S
CN107	B-1C
	B-1S
CN108	C-1C
	C-1S
CN109	A-1C
	A-1S
CN110	G-4C
	G-4S
CN111	C-4C
	C-3S
CN112	D-1C
	D-1S
CN113	D-2C
	D-2S
CN114	C-4C
	C-4S
CN115	F-1C
	F-1S
CN116	A-3C
	A-3S
CN117	A-2C
	A-2S
CN118	A-2C
	A-2S
CN119	A-3C
	A-3S
CN120	A-1C
	A-1S
CN121	A-4C
	A-4S
CN122	F-2C
	F-2S
CN123	C-1C
	C-1S
CN124	D-1C
	D-1S
CN125	E-1C
	E-1S
CN126	F-1C
	F-1S
CN127	F-2C
	F-2S
CN128	F-3C
	F-3S
CN129	F-3C
	F-3S
CN130	G-5C
	G-5S
CN131	B-4C
	B-4S
CN132	F-4C

SW-312 HN-106 FL-70 | FL-70 HN-106 SW-312

FL-70 BOARD

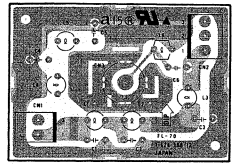
SER NO. 10041-	(UC)
30016-	(J)
40121-	(EK)



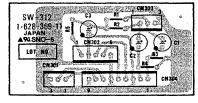
1-628-370-12 SOLDERING SIDE

HN-106 (1-628-370-12)

CN101	E-1C
	E-1S
CN102	E-2C
	E-2S
CN103	E-3C
	E-3S
CN104	E-4C
	E-4S
CN105	F-4C
	F-4S
CN106	C-1C
	C-1S
CN107	B-1C
	B-1S
CN108	C-1C
	C-1S
CN109	A-1C
	A-1S
CN110	G-4C
	G-4S
CN111	C-4C
	C-3S
CN112	D-1C
	D-1S
CN113	D-2C
	D-2S
CN114	C-4C
	C-4S
CN115	F-1C
	F-1S
CN116	A-3C
	A-3S
CN117	A-2C
	A-2S
CN118	A-2C
	A-2S
CN119	A-3C
	A-3S
CN120	A-1C
	A-1S
CN121	A-4C
	A-4S
CN122	F-2C
	F-2S
CN123	C-1C
	C-1S
CN124	D-1C
	D-1S
CN125	E-1C
	E-1S
CN126	F-1C
	F-1S
CN127	F-2C
	F-2S
CN128	F-3C
	F-3S
CN129	F-3C
	F-3S
CN130	G-5C
	G-5S
CN131	B-4C
	B-4S
CN132	F-4C



SW-312 BOARD



1-628-369-11 COMPONENT SIDE

SW312 HN-106 FL-70 FRAME

FRAME FL-70 HN-106 SW-312

FRAME WIRING
FL-70 BOARD
HN-106 BOARD
SW-312 BOARD

CHANGE INFORMATION					
MADE	ADDRESS	REF No.	DESCRIPTION	EFFECTIVE SER No.	
#1		S1/HN-106	ADDED	10641- &ID 30014- LE 40121- IE&D	

DC-43 BOARD

DC-42 BOARD

HN-106 BOARD

VA-80 BOARD

CAMERA

RX

TR

MD (C)

MD (Y)

CA-55 (UC) 1-R4
CA-55 (J) 1-R4
CA-55P (EK) 1-R5

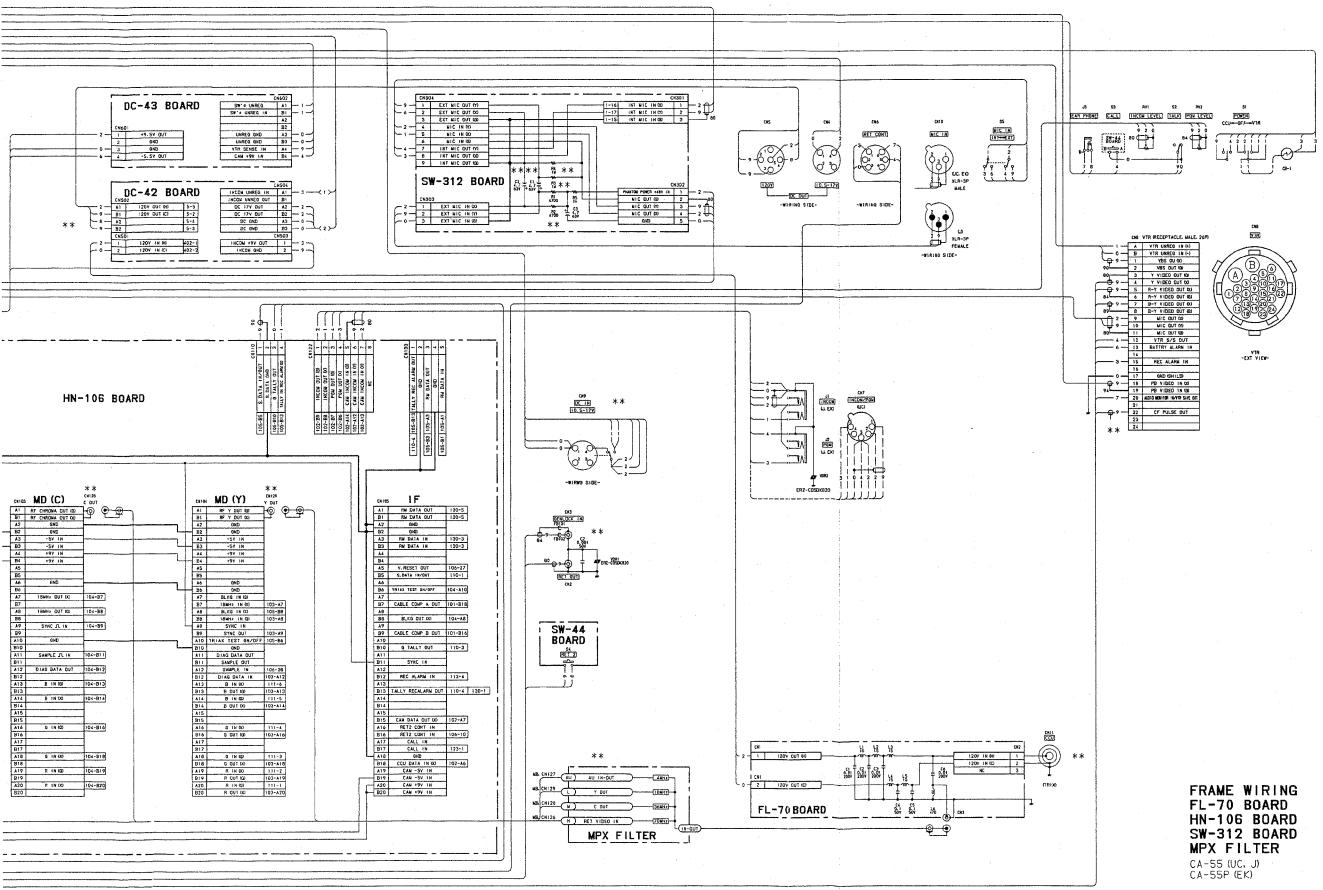
C-43

C-44

A | B | C | D | E | F | G

SW-312 HN-106 FL-70 FRAME

FRAME FL-70 HN-106 SW-312



FRAME WIRING
FL-70 BOARD
HN-106 BOARD
SW-312 BOARD
MPX FILTER

CA-55 (UC, J)
CA-55P (EK)

C-45

C-46

B-CA55-FRAME/MS

1 2 3 4 5 6

G H I J K L M

SECTION D
SPARE PARTS

PARTS INFORMATION

1. **Safety Related Component Warning**

   Components identified by shading marked with ⚠ on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony parts whose parts numbers appear as shown in this manual or in service manual supplements published by Sony.

2. Replacement Parts supplied from Sony Parts Center will sometimes have different shape and outside view from the parts which actually in use. This is due to "**accommodating the improved parts and/or engineering changes**" or "**standardization of genuine parts.**" This manual's exploded view and electrical spare parts lists are indicating the parts numbers of "the standardized genuine parts at present." Regarding engineering parts and diagrams changes in our engineering department, refer SECTION 9. CHANGE INFORMATION.

3. **The parts marked with "S" in the SP column** of the exploded views and electical spare parts list are nomally required for routine service work. Orders for parts marked with "O" will be processed, but allow for additional delivery time.

4. Item with no parts number and/or no description are not stocked because they are seldom required for routine service.

5. **Abbreviation**

REF.No.	DESCRIPTION	REF.No.	DESCRIPTION	REF.No.	DESCRIPTION
C	CAPACITOR	IC	IC	R	RESISTOR
CN	CONNECTOR	L	INDUCTOR	RV	VARIABLE RESISTOR
CP	COMBINATION PARTS	LV	VARIABLE INDUCTOR	T	TRANSFORMER
D	DIODE	Q	TRANSISTOR	VDR	OSCILLATOR
FB	FERRITE BEAD RIND	S	SWITCH	X	OSCILLATOR
FL	FILTER				

All capacitors are in micro farads unless otherwise specified.
All inductors are in micro henries unless otherwise specified.
All resistors are in ohms.

CHASSIS ASSY

No.	Part No.	SP	Description
1	A-7513-900-A	o	MOUNTED CIRCUIT BOARD, FL-70
2	A-7603-113-A	s	TRIAX ASSY
3	X-2380-734-1	o	PLATE (RIGHT) ASSY, SIDE
4	X-2380-735-1	o	PLATE (LEFT) ASSY, SIDE
5	X-2380-736-1	o	CONNECTOR (B) SUB ASSY
6	X-3710-037-1	o	SUSPENSION ASSY (C)
7	1-237-981-11	s	RES, VAR, CARBON 20K "INCOM LEVEL"
8	1-507-251-XX	s	JACK "EARPHONE"
9	1-507-676-00	s	JACK, PHONE "INCOM" "PGM" (FOR J,EK)
10	1-509-176-31	s	CONNECTOR, MALE 3P "MIC IN" (FOR J)
11	1-509-184-31	s	CONNECTOR, FEMALE 3P "MIC IN"(FOR UC,EK)
12	1-553-739-21	s	SWITCH, KEY BOARD "CALL" "RETURN 2"
13	1-561-233-21	s	CONNECTOR, FEMALE 6P "RET OUT"
14	1-561-781-21	s	CONNECTOR, BNC, FEMALE "GENLOCK IN"
15	1-561-844-00	s	CONNECTOR, COAXIAL, FEMALE "CCU"(FOR EK)
16	1-562-244-00	s	CONNECTOR, MALE 26P "VTR"
17	1-565-908-11	s	CONNECTOR, MALE, 4P "DC IN"
18	1-563-907-11	s	HOUSING, CONNECTOR (D02 F) 50P
19	1-565-072-11	s	CONNECTOR, FEMALE, 4P "DC OUT"
20	1-565-797-11	s	CONNECTOR, DOUBLE COAXIAL "CCU" (FOR J)
21	1-565-800-11	o	CONNECTOR, FEMALE 5P "DC OUT"
22	1-565-801-11	s	CONNECTOR, DOUBLE COAXIAL "CCU" (FOR UC)
23	1-570-928-11	s	SWITCH, TOGGLE "POWER"
24	1-571-368-11	s	SWTCH, TOGGLE "TALK" "MIC IN"
25	1-628-369-11	o	PRINTED CIRCUIT BOARD, SW-312
26	2-122-059-01	o	SPRING
27	2-128-233-01	o	RETAINER (L), PC BOARD
28	2-128-234-01	o	SHEET, INSULATING, MPX
29	2-128-240-01	s	LABEL, GEN LOCK
30	2-128-241-01	o	LABEL, VTR
31	2-128-243-01	o	PLATE, BOX, CONNECTOR
32	2-128-244-01	o	NUT (SW), PLATE
33	2-128-245-01	o	PLATE (XLR), PHONE (FOR UC)
34	2-128-253-01	o	BRACKET, CONNECTOR
35	2-128-257-01	o	LABEL, POWER
36	2-128-258-01	o	LABEL, DC
37	2-128-265-01	o	BOX (B), CONNECTOR
38	2-128-269-01	o	BOX (T), CONNECTOR
39	2-132-244-01	o	SPACER
40	2-359-964-01	o	SCREW
41	2-359-980-01	s	PAD, CHEEK
42	2-361-586-00	o	PLATE (F) (1), CONNECTOR (FOR EK)
43	2-361-598-00	o	PLATE (K) (1), CONNECTOR (FOR J,UC)
44	2-365-236-00	o	LUG (K), GROUND (FOR UC)
45	3-437-229-01	s	INSULATOR (B), JACK
46	3-657-627-00	s	KNOB (2)
47	3-657-841-51	o	SPACER (2X6)
48	3-664-213-00	o	SCREW, STOPPER
49	3-664-218-00	o	SHUE
50	3-664-228-00	o	PLATE, SPRING
51	3-673-018-11	s	SCREW, BLIND
52	3-676-125-00	o	PIN, STOPPER
53	3-676-244-11	o	COVER, SW
54	3-676-349-00	o	SHOE, V
55	3-676-352-00	s	CAP, C HOLDER
56	3-676-365-04	o	HOLDER, V CONNECTOR
57	3-676-369-00	o	NUT, SPACER
58	3-676-370-00	s	PIN, HOLDER, CR
59	3-676-371-00	o	NUT (S), PLATE
60	3-685-104-01	s	NUT (M6), CONTROL
61	3-685-115-01	s	CAP (6P), DROP PROTECTION
62	3-701-440-11	s	WASHER, 3.5
63	3-710-016-02	s	SCREW (M4X18), LID
64	3-849-405-00	s	COVER, EARPHONE JACK

CA-55 (UC) 1-R4
CA-55 (J) 1-R5
CA-55P (EK) 1-R5

CARD RACK AND POWER ASSY

No.	Part No.	SP	Description
101	A-7513-874-A	o	MOUNTED CIRCUIT BOARD, RX-6
102	A-7513-875-A	o	MOUNTED CIRCUIT BOARD, TR-47
103	A-7513-876-A	o	MOUNTED CIRCUIT BOARD, MD-54
104	A-7513-877-A	o	MOUNTED CIRCUIT BOARD, MD-55
105	A-7513-895-A	o	MOUNTED CIRCUIT BOARD, MN-106
106	A-7513-896-A	o	MOUNTED CIRCUIT BOARD, DC-42
107	A-7513-897-A	o	MOUNTED CIRCUIT BOARD, DC-43
108	A-7513-898-A	o	MOUNTED CIRCUIT BOARD, VA-80
109	A-7513-899-A	o	MOUNTED CIRCUIT BOARD, IF-227
110	X-2380-737-1	o	COVER ASSY, SHIELD
111	X-2380-738-1	o	CHASSIS SUB ASSY
112	1-236-279-31	s	FILTER, MPX
113	1-532-681-00	s	CIRCUIT BREAKER
114	2-128-248-01	o	SHEET, RADIATION
115	2-128-262-01	o	HEAT SINK
116	2-128-264-01	o	COVER, SHIELD
117	2-128-286-01	o	SUPPORT, VA
118	3-657-983-02	o	SUPPORT (2), D PANEL

SCREWS

+B
Btm-N

7-621-000-00

SIZE	Parts No.
3 x 3	772-00
x 4	772-10
x 5	771-06
x 6	772-20
x 8	772-40
x 10	772-50
x 12	772-60
x 14	772-70
x 16	772-80
x 20	–
2.6 x 3	775-90
x 4	775-10
x 5	775-20
x 6	773-95
x 8	775-40
x 10	775-50
x 12	775-60
x 14	775-70
x 16	775-80
x 20	776-90

+B
Btm-N

7-621-000-00

SIZE	Parts No.
2 x 2	772-05
x 3	772-15
x 4	771-05
x 5	772-25
x 6	772-45
x 8	772-55
x 10	772-65
x 12	772-75
x 14	772-85
x 16	772-90
x 20	–
2.6 x 2	775-00
x 3	773-96
x 4	770-97
x 5	770-07
x 6	770-17
x 8	770-27
x 10	773-47
x 12	775-68
x 14	775-78
x 16	775-88
x 20	773-91

+B
Btm-N

7-621-000-00

SIZE	Parts No.
3 x 3	544-06
x 4	545-01
x 5	545-08
x 6	547-01
x 8	548-04
x 10	549-00
x 12	550-09
x 14	551-06
x 16	552-04
x 20	553-06
x 30	968-00
4 x 4	556-00
x 5	559-05
x 6	560-00
x 8	561-05
x 10	562-00
x 12	563-05
x 14	564-00
x 16	565-06
x 20	566-05
5 x 8	574-09
x 10	573-09
x 12	576-09
x 14	577-06
x 16	578-06
x 20	579-06

+B
Cr-N

7-621-000-00

SIZE	Parts No.
3 x 3	544-04
x 4	545-01
x 5	546-04
x 6	547-01
x 8	548-04
x 10	549-04
x 12	550-01
x 14	551-04
x 16	552-04
x 20	553-04
4 x 4	556-04
x 5	559-04
x 6	560-04
x 8	561-04
x 10	562-04
x 12	563-04
x 14	564-01
x 16	565-04
x 20	566-04
5 x 8	574-04
x 10	575-04
x 12	576-04
x 14	577-04
x 16	578-04
x 20	579-04

+K
Btm-N

7-622-000-00

SIZE	Parts No.
3 x 4	245-09
x 5	246-02
x 6	247-03
x 8	248-01
x 10	249-09
x 12	250-09
x 14	251-03
x 16	252-08
x 20	253-09
4 x 6	260-09
x 8	261-09
x 10	262-09
x 12	263-09
x 14	264-09
x 16	265-09
x 20	266-09
5 x 8	274-09
x 10	275-09
x 12	276-09
x 14	277-09
x 16	278-09
x 20	279-09
x 25	280-09
x 30	281-09
x 35	282-09
x 40	283-09
x 45	284-09
x 50	285-09

+K
Cr-N

7-622-000-00

SIZE	Parts No.
3 x 4	245-04
x 5	246-04
x 6	247-04
x 8	248-04
x 10	249-04
x 12	250-04
x 14	251-04
x 16	252-04
x 20	253-04
4 x 5	260-04
x 6	261-04
x 8	262-04
x 10	263-04
x 12	264-04
x 14	265-04
x 16	266-04
x 20	267-04

+PS
Cr-N

7-622-000-00

SIZE	Parts No.
2 x 4	253-85
x 5	253-13
x 6	253-25
x 8	253-25
x 10	253-45
x 12	253-95
2.6 x 4	253-09
x 5	254-05
x 6	254-15
x 8	254-25
x 10	254-35
x 12	254-45
x 14	254-85
x 16	254-55
x 20	254-65
3 x 5	645-01
x 6	647-01
x 8	648-01
x 10	649-01
x 12	650-01
x 14	651-01
x 16	652-01
x 20	653-01
4 x 6	660-01
x 8	661-01
x 10	662-01
x 12	663-01
x 14	664-01
x 16	665-01
x 20	666-01

+PW
Cr-N

7-623-000-00

SIZE	Parts No.
3 x 6	947-01
x 8	948-01
x 10	949-01
x 12	950-01
x 14	951-01
x 16	952-01
x 20	953-01
x 25	954-01
x 30	955-01
x 35	956-01
x 40	957-01
4 x 8	961-01
x 10	962-01
x 12	963-01
x 14	964-01
x 16	965-01
x 20	966-01
x 25	967-01
x 30	968-01
x 35	969-01
x 40	970-01

PRECISION +P
Btm-N

7-637-000-00

SIZE	Parts No.
1.7 x 1.5	552-18
x 1.8	–
x 2	552-26
x 2.2	–
x 2.5	552-06
x 2.8	–
x 3	552-36
x 3.5	552-76
x 4	552-46
x 4.5	–
x 5	552-56
x 5.5	–
x 6	–
2 x 1.8	554-36
x 2	553-16
x 2.2	–
x 2.5	553-26
x 2.8	554-66
x 3	553-36
x 3.5	554-16
x 4	553-46
x 4.5	553-56
x 5	554-26
x 5.5	–
x 6	553-66
x 8	554-27
x 7	553-86
x 8	553-96
x 10	553-76
2.6 x 2.8	556-09
x 3	–
x 3.5	556-29
x 4	556-39
x 4.5	556-49
x 5	556-59
x 6.5	–
x 6	556-79
x 7	–
x 8	–
x 9	–
x 10	–

PRECISION +P
Cr-N

7-637-000-00

SIZE	Parts No.
1.7 x 1.6	–
x 1.8	–
x 2	552-27
x 2.2	552-87
x 2.5	552-07
x 2.8	–
x 3	552-37
x 3.5	–
x 4	552-47
x 4.5	552-57
x 5	552-57
x 5.5	552-67
x 6	552-77
x 1.8	554-37
x 2	553-17
x 2.2	554-67
x 2.5	553-27
x 2.8	–
x 3	553-37
x 3.5	554-17
x 4	553-47
x 4.5	553-57
x 5	554-27
x 5.5	–
x 6	553-67
x 8	554-27
x 7	553-87
x 8	553-97
x 10	553-77
2.6 x 2.8	556-07
x 3	–
x 3.5	–
x 4	556-37
x 4.5	–
x 5	556-57
x 5.5	–
x 6	556-77
x 7	–
x 8	556-97
x 9	–
x 10	557-47

+P
Cr-N

7-621-000-00

SIZE	Parts No.
2 x 3	255-15
x 4	255-25
x 5	255-35
x 6	255-45
x 8	255-55
x 10	255-65
x 12	255-75
x 14	255-85
x 16	255-95
x 20	256-25
2.6 x 3	256-15
x 4	256-25
x 5	256-35
x 6	256-45
x 8	256-55
x 10	256-65
x 12	256-75
x 14	256-85
x 16	256-95
x 20	257-25

HEXAGON SET SCREW (FLAT)
SNCMS-P0

7-621-000-00

SIZE	Parts No.
2 x 2.5	731-08
2 x 3	732-06
2 x 4	733-08
2 x 6	–
2 x 8	–
2.6 x 3	737-06
2.6 x 4	738-08
2.6 x 5	739-08
2.6 x 6	740-08

BOLT, HEXAGON SOCKET
SNCMB B2n-N4

7-669-000-00

SIZE	Parts No.
3 x 4	401-04
3 x 5	402-04
3 x 6	403-04
3 x 8	404-04
3 x 10	405-04
3 x 12	406-04
3 x 14	407-04
3 x 16	408-04
3 x 20	410-04
4 x 5	417-04
4 x 6	418-04
4 x 8	419-04
4 x 10	420-04
4 x 12	421-04
4 x 14	422-04
4 x 16	423-04
4 x 20	425-04
4 x 25	427-04
5 x 6	434-04
5 x 10	435-04
5 x 12	436-04
5 x 14	437-04
5 x 16	438-04
5 x 20	440-04
5 x 25	442-04
5 x 30	444-04
5 x 50	447-04
6 x 10	452-04
6 x 12	453-04
6 x 14	454-04
6 x 16	455-04
6 x 20	457-04
6 x 25	459-04
6 x 30	461-04
6 x 35	463-04
6 x 40	465-04
6 x 45	466-04
6 x 50	468-04
8 x 12	470-04
8 x 14	471-04
8 x 16	472-04
8 x 20	473-04
8 x 25	474-04
8 x 30	475-04
8 x 35	476-04
8 x 40	477-04
8 x 45	478-04
8 x 50	479-04

+B TP
Cr-N NON-SLIT

7-685-000-00

SIZE	Parts No.
2.6 x 4	131-19
2.6 x 5	132-19
2.6 x 6	133-19
2.6 x 8	134-19
2.6 x 10	135-19
2.6 x 12	136-19
2.6 x 14	137-19
2.6 x 16	138-19
3 x 5	144-19
3 x 6	645-79
3 x 8	646-79
3 x 10	647-79
3 x 12	648-79
3 x 14	649-79
3 x 16	650-79
3 x 20	651-79
3 x 25	652-79
3 x 30	653-79
3 x 35	654-79
3 x 40	135-19
3 x 45	–
3 x 50	656-14
3 x 60	–

CAPACITOR. TANTALUM

Part No.	SP	Description			
1-131-396-00	s	CAP. TANTALUM	0.01	20%	35V
1-131-397-00	s	CAP. TANTALUM	0.015	20%	35V
1-131-398-00	s	CAP. TANTALUM	0.022	20%	35V
1-131-399-00	s	CAP. TANTALUM	0.033	20%	35V
1-131-400-00	s	CAP. TANTALUM	0.047	20%	35V
1-131-401-00	s	CAP. TANTALUM	0.068	10%	35V
1-131-341-00	s	CAP. TANTALUM	0.1	10%	35V
1-131-342-00	s	CAP. TANTALUM	0.15	10%	35V
1-131-343-00	s	CAP. TANTALUM	0.22	10%	35V
1-131-344-00	s	CAP. TANTALUM	0.33	10%	35V
1-131-412-00	s	CAP. TANTALUM	0.47	20%	20V
1-131-345-00	s	CAP. TANTALUM	0.47	10%	35V
1-131-410-00	s	CAP. TANTALUM	0.68	20%	25V
1-131-346-00	s	CAP. TANTALUM	0.68	10%	35V
1-131-413-00	s	CAP. TANTALUM	1.0	20%	20V
1-131-347-00	s	CAP. TANTALUM	1.0	10%	35V
1-131-416-00	s	CAP. TANTALUM	1.5	20%	16V
1-131-348-00	s	CAP. TANTALUM	1.5	10%	35V
1-131-419-00	s	CAP. TANTALUM	2.2	20%	10V
1-131-361-00	s	CAP. TANTALUM	2.2	10%	20V
1-131-349-00	s	CAP. TANTALUM	2.2	10%	35V
1-131-422-00	s	CAP. TANTALUM	3.3	20%	6.3V
1-131-368-00	s	CAP. TANTALUM	3.3	10%	16V
1-131-356-00	s	CAP. TANTALUM	3.3	10%	25V
1-131-350-00	s	CAP. TANTALUM	3.3	10%	35V
1-131-425-00	s	CAP. TANTALUM	4.7	20%	3.15V
1-131-375-00	s	CAP. TANTALUM	4.7	10%	10V
1-131-363-00	s	CAP. TANTALUM	4.7	10%	20V
1-131-351-00	s	CAP. TANTALUM	4.7	10%	35V
1-131-382-00	s	CAP. TANTALUM	6.8	10%	6.3V
1-131-370-00	s	CAP. TANTALUM	6.8	10%	16V
1-131-358-00	s	CAP. TANTALUM	6.8	10%	25V
1-131-352-00	s	CAP. TANTALUM	6.8	10%	35V
1-131-369-00	s	CAP. TANTALUM	10	10%	3.15V
1-131-377-00	s	CAP. TANTALUM	10	10%	10V
1-131-365-00	s	CAP. TANTALUM	10	10%	20V
1-131-353-00	s	CAP. TANTALUM	10	10%	35V
1-131-384-00	s	CAP. TANTALUM	15	10%	6.3V
1-131-372-00	s	CAP. TANTALUM	15	10%	16V
1-131-360-00	s	CAP. TANTALUM	15	10%	25V
1-131-391-00	s	CAP. TANTALUM	22	10%	3.15V
1-131-379-00	s	CAP. TANTALUM	22	10%	10V
1-131-367-00	s	CAP. TANTALUM	22	10%	20V
1-131-386-00	s	CAP. TANTALUM	33	10%	6.3V
1-131-374-00	s	CAP. TANTALUM	33	10%	16V
1-131-393-00	s	CAP. TANTALUM	47	10%	3.15V
1-131-381-00	s	CAP. TANTALUM	47	10%	10V
1-131-388-00	s	CAP. TANTALUM	68	10%	6.3V
1-131-395-00	s	CAP. TANTALUM	100	10%	3.15V

CAPACITOR. CHIP CERAMIC

Part No.	SP	Description			
1-163-083-00	s	CAP. CHIP CERAMIC	1pF	+-0.25pF	5
1-163-085-00	s	CAP. CHIP CERAMIC	2pF	+-0.25pF	5
1-163-087-00	s	CAP. CHIP CERAMIC	4pF	+-0.25pF	5
1-163-089-00	s	CAP. CHIP CERAMIC	6pF	+-0.5pF	50
1-163-091-00	s	CAP. CHIP CERAMIC	8pF	+-0.5pF	50
1-163-093-00	s	CAP. CHIP CERAMIC	10pF	5%	50V
1-163-097-00	s	CAP. CHIP CERAMIC	15pF	5%	50V
1-163-101-00	s	CAP. CHIP CERAMIC	22pF	5%	50V
1-163-105-00	s	CAP. CHIP CERAMIC	33pF	5%	50V
1-163-109-00	s	CAP. CHIP CERAMIC	47pF	5%	50V
1-163-113-00	s	CAP. CHIP CERAMIC	68pF	5%	50V
1-163-117-00	s	CAP. CHIP CERAMIC	100pF	5%	50V
1-163-121-00	s	CAP. CHIP CERAMIC	150pF	5%	50V
1-163-125-00	s	CAP. CHIP CERAMIC	220pF	5%	50V
1-163-129-00	s	CAP. CHIP CERAMIC	330pF	5%	50V
1-163-133-00	s	CAP. CHIP CERAMIC	470pF	5%	50V
1-163-137-00	s	CAP. CHIP CERAMIC	680pF	5%	50V
1-163-141-00	s	CAP. CHIP CERAMIC	1000pF	5%	50V
1-163-145-00	s	CAP. CHIP CERAMIC	1500pF	10%	50V
1-163-013-00	s	CAP. CHIP CERAMIC	2200pF	10%	50V
1-163-015-00	s	CAP. CHIP CERAMIC	3300pF	10%	50V
1-163-017-00	s	CAP. CHIP CERAMIC	4700pF	10%	50V
1-163-019-00	s	CAP. CHIP CERAMIC	6800pF	10%	50V
1-163-021-00	s	CAP. CHIP CERAMIC	0.01	10%	50V
1-163-023-00	s	CAP. CHIP CERAMIC	0.015	10%	50V
1-163-034-00	s	CAP. CHIP CERAMIC	0.033		50V
1-163-035-00	s	CAP. CHIP CERAMIC	0.047		50V
1-163-036-00	s	CAP. CHIP CERAMIC	0.068		50V
1-163-038-00	s	CAP. CHIP CERAMIC	0.1		50V

RESISTOR. CHIP

Part No.	SP	Description
1-216-295-00	s	RES. CHIP 0 5% 1/10W
1-216-298-00	s	RES. CHIP 2.2 5% 1/10W
1-216-302-00	s	RES. CHIP 2.7 5% 1/10W
1-216-304-00	s	RES. CHIP 3.3 5% 1/10W
1-216-306-00	s	RES. CHIP 3.9 5% 1/10W
1-216-308-00	s	RES. CHIP 4.7 5% 1/10W
1-216-309-00	s	RES. CHIP 5.6 5% 1/10W
1-216-311-00	s	RES. CHIP 6.8 5% 1/10W
1-216-313-00	s	RES. CHIP 8.2 5% 1/10W
1-216-001-00	s	RES. CHIP 10 5% 1/10W
1-216-003-00	s	RES. CHIP 12 5% 1/10W
1-216-005-00	s	RES. CHIP 15 5% 1/10W
1-216-007-00	s	RES. CHIP 18 5% 1/10W
1-216-009-00	s	RES. CHIP 22 5% 1/10W
1-216-011-00	s	RES. CHIP 27 5% 1/10W
1-216-013-00	s	RES. CHIP 33 5% 1/10W
1-216-015-00	s	RES. CHIP 39 5% 1/10W
1-216-017-00	s	RES. CHIP 47 5% 1/10W
1-216-019-00	s	RES. CHIP 56 5% 1/10W
1-216-021-00	s	RES. CHIP 68 5% 1/10W
1-216-023-00	s	RES. CHIP 82 5% 1/10W
1-216-025-00	s	RES. CHIP 100 5% 1/10W
1-216-027-00	s	RES. CHIP 120 5% 1/10W
1-216-029-00	s	RES. CHIP 150 5% 1/10W
1-216-031-00	s	RES. CHIP 180 5% 1/10W
1-216-033-00	s	RES. CHIP 220 5% 1/10W
1-216-035-00	s	RES. CHIP 270 5% 1/10W
1-216-037-00	s	RES. CHIP 330 5% 1/10W
1-216-039-00	s	RES. CHIP 390 5% 1/10W
1-216-041-00	s	RES. CHIP 470 5% 1/10W
1-216-043-00	s	RES. CHIP 560 5% 1/10W
1-216-045-00	s	RES. CHIP 680 5% 1/10W
1-216-047-00	s	RES. CHIP 820 5% 1/10W
1-216-049-00	s	RES. CHIP 1k 5% 1/10W
1-216-051-00	s	RES. CHIP 1.2k 5% 1/10W
1-216-053-00	s	RES. CHIP 1.5k 5% 1/10W
1-216-055-00	s	RES. CHIP 1.8k 5% 1/10W
1-216-057-00	s	RES. CHIP 2.2k 5% 1/10W
1-216-059-00	s	RES. CHIP 2.7k 5% 1/10W
1-216-061-00	s	RES. CHIP 3.3k 5% 1/10W
1-216-063-00	s	RES. CHIP 3.9k 5% 1/10W
1-216-065-00	s	RES. CHIP 4.7k 5% 1/10W
1-216-067-00	s	RES. CHIP 5.6k 5% 1/10W
1-216-069-00	s	RES. CHIP 6.8k 5% 1/10W
1-216-071-00	s	RES. CHIP 8.2k 5% 1/10W
1-216-073-00	s	RES. CHIP 10k 5% 1/10W
1-216-075-00	s	RES. CHIP 12k 5% 1/10W
1-216-077-00	s	RES. CHIP 15k 5% 1/10W
1-216-079-00	s	RES. CHIP 18k 5% 1/10W
1-216-081-00	s	RES. CHIP 22k 5% 1/10W
1-216-083-00	s	RES. CHIP 27k 5% 1/10W
1-216-085-00	s	RES. CHIP 33k 5% 1/10W
1-216-087-00	s	RES. CHIP 39k 5% 1/10W
1-216-089-00	s	RES. CHIP 47k 5% 1/10W
1-216-091-00	s	RES. CHIP 56k 5% 1/10W
1-216-093-00	s	RES. CHIP 68k 5% 1/10W
1-216-095-00	s	RES. CHIP 82k 5% 1/10W
1-216-097-00	s	RES. CHIP 100k 5% 1/10W
1-216-099-00	s	RES. CHIP 120k 5% 1/10W
1-216-101-00	s	RES. CHIP 150k 5% 1/10W

(RESISTOR. CHIP)

Part No.	SP	Description
1-216-103-00	s	RES. CHIP 180k 5% 1/10W
1-216-105-00	s	RES. CHIP 220k 5% 1/10W
1-216-107-00	s	RES. CHIP 270k 5% 1/10W
1-216-109-00	s	RES. CHIP 330k 5% 1/10W
1-216-111-00	s	RES. CHIP 390k 5% 1/10W
1-216-113-00	s	RES. CHIP 470k 5% 1/10W
1-216-115-00	s	RES. CHIP 560k 5% 1/10W
1-216-117-00	s	RES. CHIP 680k 5% 1/10W
1-216-119-00	s	RES. CHIP 820k 5% 1/10W
1-216-121-00	s	RES. CHIP 1.0M 5% 1/10W
1-216-123-00	s	RES. CHIP 1.2M 5% 1/10W
1-216-125-00	s	RES. CHIP 1.5M 5% 1/10W
1-216-127-00	s	RES. CHIP 1.8M 5% 1/10W
1-216-129-00	s	RES. CHIP 2.2M 5% 1/10W
1-216-131-00	s	RES. CHIP 2.7M 5% 1/10W
1-216-133-00	s	RES. CHIP 3.3M 5% 1/10W

DC-42 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7513-896-A	o	MOUNTED CIRCUIT BOARD, DC-42
C2	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C3	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C4	1-126-108-11	s	ELECT 10MF 20% 25V
C5	1-127-512-00	s	ELECT(SOLID) 10MF 20% 25V
C6	1-136-187-11	s	FILM 0.047MF 5% 250V
C7	1-126-527-11	s	ELECT 47MF 20% 200V
C8	1-126-527-11	s	ELECT 47MF 20% 200V
C10	1-130-496-00	s	MYLAR 0.1MF 5% 50V
C11	1-130-789-00	s	FILM 1MF 5% 100V
C12	1-130-789-00	s	FILM 1MF 5% 100V
C13	1-161-896-11	s	CERAMIC 0.22MF 50V
C14	1-126-140-11	s	ELECT 470uF 20% 25V
C15	1-126-140-11	s	ELECT 470uF 20% 25V
C17	1-126-140-11	s	ELECT 470uF 20% 25V
C18	1-124-580-11	s	ELECT 330MF 20% 25V
C19	1-126-140-11	s	ELECT 470uF 20% 25V
C20	1-127-513-00	s	ELECT(SOLID) 15MF 20% 25V
C21	1-161-021-11	s	CERAMIC 0.047uF 10% 25V
CN501	1-564-977-11	o	CONNECTOR, MALE 2P
CN502	1-506-617-11	o	CONNECTOR, PS 4P, MALE
CN503	1-506-483-11	o	CONNECTOR, 2P, MALE
CN504	1-506-618-11	o	CONNECTOR, PS 6P, MALE
D1	8-719-160-83	s	DIODE RD30FB1
D2	8-719-109-89	s	DIODE RD5.6E-B2
D3	8-719-110-49	s	DIODE RD16EB1
D4	8-719-911-55	s	DIODE 1G5G
D5	8-719-800-76	s	DIODE 1SS123
D6	8-719-920-40	s	DIODE ESAC82-004
D7	8-719-920-40	s	DIODE ESAC82-004
D8	8-719-911-55	s	DIODE 1G5G
D9	8-719-911-55	s	DIODE 1G5G
D10	8-719-911-55	s	DIODE 1G5G
IC1	8-759-982-34	s	IC RC78M09FA
L1	1-408-549-00	s	150MH
L3	1-408-142-21	s	22.5MH
Q1	8-729-105-37	s	TRANSISTOR 2SC3360
Q2	8-729-105-37	s	TRANSISTOR 2SC3360
Q3	8-729-105-08	s	TRANSISTOR 2SA1330-O6
Q4	8-729-203-81	s	TRANSISTOR 2SC2236B-Y
Q5	8-729-105-37	s	TRANSISTOR 2SC3360
Q6	8-729-105-37	s	TRANSISTOR 2SC3360
Q7	8-729-114-53	s	TRANSISTOR 2SD1033-K
Q8	8-729-100-66	s	TRANSISTOR 2SC1623
Q9	8-729-216-22	s	TRANSISTOR 2SA812-M6
Q10	8-729-924-41	s	TRANSISTOR 2SC2440
Q11	8-729-924-41	s	TRANSISTOR 2SC2440
R5	1-249-436-11	s	CARBON 39K 5% 1/4W
R10	1-249-413-11	s	CARBON 470 5% 1/4W
R11	1-249-484-11	s	CARBON 6.8 5% 1/2W
R14	1-249-438-11	s	CARBON 56K 5% 1/4W
R19	1-249-485-11	s	CARBON 8.2 5% 1/2W
T1	1-424-135-11	s	FILTER, LINE
T2	1-437-117-21	s	TRANSFORMER, DRIVE
T3	1-437-111-00	s	TRANSFORMER, DRIVE
T4	1-449-419-11	s	TRANSFORMER, CONVERTER

DC-43 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7513-897-A	o	MOUNTED CIRCUIT BOARD, DC-43
C2	1-126-375-11	s	ELECT 100MF 20% 25V
C3	1-127-513-00	s	ELECT(SOLID) 15MF 20% 25V
C5	1-126-541-11	s	ELECT 330uF 20% 16V
C6	1-127-517-11	s	ELECT(SOLID) 150MF 20% 16V
C8	1-127-520-11	s	ELECT(SOLID) 68MF 20% 20V
C10	1-126-541-11	s	ELECT 330uF 20% 16V
C11	1-127-516-11	s	ELECT(SOLID) 220MF 20% 10V
C13	1-163-011-11	s	CERAMIC CHIP 0.0015uF 10% 50V
C15	1-164-161-11	s	CERAMIC CHIP 0.0022MF 10% 50V
C16	1-124-968-11	s	ELECT 4.7uF 20% 50V
C17	1-126-109-11	s	ELECT 10MF 20% 25V
C18	1-164-161-11	s	CERAMIC CHIP 0.0022MF 10% 50V
C22	1-124-598-11	s	ELECT 22uF 20% 25V
C23	1-126-375-11	s	ELECT 100MF 20% 25V
CN501	1-506-483-21	o	CONNECTOR, 4P, MALE
CN502	1-506-619-11	o	CONNECTOR, 8P FEMALE
D1	8-719-911-55	s	DIODE 1G5G
D2	8-719-981-00	s	DIODE ERB81-004
D3	8-719-981-00	s	DIODE ERB81-004
IC1	8-759-937-36	s	IC TL1451ACNS
L1	1-410-283-11	s	48uH (WITH CORE)
L2	1-459-886-11	s	COIL, TROIDAL
L3	1-421-957-11	s	COIL, CHOKE 30UH
L4	1-459-887-11	s	COIL, TROIDAL
L5	1-410-284-11	s	10uH (WITH CORE)
L6	1-408-409-00	s	10uH
Q1	8-729-105-29	s	TRANSISTOR 2SA1385
Q2	8-729-105-29	s	TRANSISTOR 2SA1385
Q3	8-729-216-22	s	TRANSISTOR 2SA812-M6
Q4	8-729-100-66	s	TRANSISTOR 2SC1623
Q5	8-729-216-22	s	TRANSISTOR 2SA812-M6
R1	1-216-627-11	s	METAL CHIP 100 0.50% 1/10W
R2	1-249-414-11	s	CARBON 560 5% 1/4W
R3	1-216-694-11	s	METAL CHIP 62K 0.5% 1/10W
R4	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R5	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R6	1-216-631-11	s	METAL CHIP 150 0.50% 1/10W
R7	1-249-414-11	s	CARBON 560 5% 1/4W
R8	1-216-685-11	s	METAL CHIP 27K 0.50% 1/10W
R9	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R10	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R13	1-216-691-11	s	METAL CHIP 47K 0.50% 1/10W
R14	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R15	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R16	1-216-693-11	s	METAL CHIP 56K 0.50% 1/10W
R17	1-216-697-11	s	METAL CHIP 82K 0.50% 1/10W
R20	1-249-423-11	s	CARBON 3.3K 5% 1/4W
R22	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R24	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R25	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R26	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
RV1	1-228-472-00	s	METAL 2K

Please see pages D-9 and D-10 for the part numbers of capacitors and resistors that are not listed in the parts list.

EX-190 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7513-880-A	o	MOUNTED CIRCUIT BOARD, EX-190
CN1	1-560-935-00	o	CONNECTOR, 40P, MALE
CN2	1-560-934-00	o	CONNECTOR, 40P, MALE

FL-70 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-628-368-11	o	PRINTED CIRCUIT BOARD, FL-70
1pc	2-128-261-01	o	CASE, SHIELD, FL
C1	1-106-367-00	s	MYLAR 0.01MF 5% 200V
C2	1-106-367-00	s	MYLAR 0.01MF 5% 200V
C3	1-106-367-00	s	MYLAR 0.01MF 5% 200V
C4	1-130-495-00	s	MYLAR 0.1MF 5% 50V
C5	1-130-495-00	s	MYLAR 0.1MF 5% 50V
C6	1-106-367-00	s	MYLAR 0.01MF 5% 200V
CN1	1-508-775-00	o	CONNECTOR, 2P, MALE
CN2	1-564-104-00	o	CONNECTOR, 9P, MALE
CN3	1-562-873-11	o	CONNECTOR, 2.5C COAXIAL
L1	1-459-442-00	s	COIL (WITH CORE)
L2	1-459-442-00	s	COIL (WITH CORE)
L3	1-459-442-00	s	COIL (WITH CORE)
L4	1-459-442-00	s	COIL (WITH CORE)
L5	1-459-442-00	s	COIL (WITH CORE)
L6	1-408-429-00	s	470uH

HN-106 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7513-895-A	o	MOUNTED CIRCUIT BOARD, HN-106
10pcs	1-560-707-00	o	POLARISING KEY
C1	1-124-120-11	s	ELECT 220MF 20% 25V
C2	1-124-120-11	s	ELECT 220MF 20% 25V
CN101	1-562-066-00	o	CONNECTOR, 40P FEMALE
CN102	1-562-066-00	o	CONNECTOR, 40P FEMALE
CN103	1-562-066-00	o	CONNECTOR, 40P FEMALE
CN104	1-562-066-00	o	CONNECTOR, 40P FEMALE
CN105	1-562-066-00	o	CONNECTOR, 40P FEMALE
CN106	1-563-239-21	o	CONNECTOR, 40P FEMALE
CN107	1-506-486-11	o	CONNECTOR, 7P, MALE
CN108	1-506-493-11	o	CONNECTOR, 14P, MALE
CN109	1-506-632-11	o	CONNECTOR, 6P MALE
CN110	1-506-483-21	o	CONNECTOR, 4P, MALE
CN111	1-506-485-11	o	CONNECTOR, 6P, MALE
CN112	1-506-481-21	o	CONNECTOR, 2P, MALE
CN113	1-506-483-21	o	CONNECTOR, 4P, MALE
CN114	1-506-485-11	o	CONNECTOR, 6P, MALE
CN115	1-506-470-11	o	CONNECTOR, 5P, MALE
CN116	1-506-470-21	o	CONNECTOR, 5P, MALE
CN117	1-506-631-11	o	CONNECTOR, 4P MALE
CN118	1-506-467-11	o	CONNECTOR, 2P, MALE
CN119	1-506-634-11	o	CONNECTOR, 10P MALE
CN120	1-506-633-11	o	CONNECTOR, 8P MALE
CN121	1-506-467-11	o	CONNECTOR, 2P, MALE
CN122	1-506-487-11	o	CONNECTOR, 8P, MALE
CN123	1-506-484-11	o	CONNECTOR, 5P, MALE
CN124	1-506-484-31	o	CONNECTOR, 5P, MALE
CN125	1-506-485-11	o	CONNECTOR, 6P, MALE
CN126	1-561-310-00	s	CONNECTOR, RF
CN127	1-561-310-00	s	CONNECTOR, RF
CN128	1-561-310-00	s	CONNECTOR, RF
CN129	1-561-310-00	s	CONNECTOR, RF
CN130	1-506-484-11	o	CONNECTOR, 5P, MALE
CN131	1-506-483-21	o	CONNECTOR, 4P, MALE
S1	1-570-839-11	s	SLIDE

Please see pages D-9 and D-10 for the part numbers of capacitors and resistors that are not listed in the parts list.

IF-227 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7513-899-A	o	MOUNTED CIRCUIT BOARD, IF-227
2pcs	1-560-707-00	o	POLARISING KEY
4pcs	1-561-724-00	o	PLUG HOUSING, FEMALE, 3P
1pc	3-711-775-01	o	FINGR, PULL
1pc	8-759-745-16	s	IC MBM27C64-25
C5	1-163-099-00	s	CERAMIC CHIP 18PF 5% 50V
C9	1-163-009-11	s	CERAMIC CHIP 0.001MF 10% 50V
C10	1-163-139-00	s	CERAMIC CHIP 820PF 5% 50V
C18	1-162-732-11	s	CERAMIC 820PF 5% 50V
C20	1-162-757-11	s	CERAMIC 0.0015MF 5% 50V
C21	1-162-724-11	s	CERAMIC 390PF 5% 50V
C22	1-162-732-11	s	CERAMIC 820PF 5% 50V
C23	1-162-732-11	s	CERAMIC 820PF 5% 50V
C24	1-162-732-11	s	CERAMIC 820PF 5% 50V
C26	1-130-487-00	s	MYLAR 0.022MF 5% 50V
C27	1-162-724-11	s	CERAMIC 390PF 5% 50V
C31	1-126-101-11	s	ELECT 100MF 20% 10V
C32	1-163-009-11	s	CERAMIC CHIP 0.001MF 10% 50V
C33	1-163-135-00	s	CERAMIC CHIP 560PF 5% 50V
C35	1-126-446-11	s	DOUBLE LAYERS 0.47F 5.5V
CN1	1-560-935-00	o	CONNECTOR, 40P, MALE
D1	8-719-800-76	s	DIODE 1SS123
D2	8-719-800-76	s	DIODE 1SS123
D3	8-719-100-03	s	DIODE 1S2835
D4	8-719-100-03	s	DIODE 1S2835
D5	8-719-100-03	s	DIODE 1S2835
D6	8-719-100-05	s	DIODE 1S2837
D8	8-719-101-97	s	DIODE 1SS97-1
IC1	8-759-918-65	s	IC TL7700CPS
IC2	8-759-321-02	s	IC HD63B05Y2F
IC3	8-759-030-16	s	IC MC34182M
IC4	8-759-200-90	s	IC TC4538BF
IC5	8-759-204-71	s	IC TC40H163F
IC6	8-759-204-71	s	IC TC40H163F
IC7	8-759-204-71	s	IC TC40H163F
IC8	8-759-201-53	s	IC TC40H000F
IC9	8-759-200-90	s	IC TC4538BF
IC10	8-759-201-53	s	IC TC40H000F
IC11	8-759-008-98	s	IC MC140408F
IC12	8-759-200-90	s	IC TC4538BF
IC13	8-759-303-90	s	IC SM6254LFP-15T
IC14	8-759-201-53	s	IC TC40H000F
IC15	8-759-030-16	s	IC MC34182M
IC16	8-759-708-05	s	IC NJM78L05A
IC17	8-759-040-76	s	IC MBM27C64-CA-55-V2.04
IC18	8-759-201-53	s	IC TC40H000F
IC19	8-759-006-07	s	IC MC14053BF
IC20	8-759-201-53	s	IC TC40H000F
L1	1-408-417-21	s	47uH
Q1	8-729-100-66	s	TRANSISTOR 2SC1623
Q2	8-729-100-66	s	TRANSISTOR 2SC1623
Q3	8-729-100-66	s	TRANSISTOR 2SC1623
Q4	8-729-216-22	s	TRANSISTOR 2SA812-M6
Q5	8-729-109-44	s	TRANSISTOR 2SK94
Q6	8-729-216-22	s	TRANSISTOR 2SA812-M6
Q7	8-729-100-66	s	TRANSISTOR 2SC1623
Q8	8-729-100-66	s	TRANSISTOR 2SC1623

(IF-227 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
Q9	8-729-100-66	s	TRANSISTOR 2SC1623
Q10	8-729-216-22	s	TRANSISTOR 2SA812-M6
Q11	8-729-216-22	s	TRANSISTOR 2SA812-M6
Q12	8-729-216-22	s	TRANSISTOR 2SA812-M6
Q13	8-729-100-66	s	TRANSISTOR 2SC1623
Q14	8-729-100-66	s	TRANSISTOR 2SC1623
Q15	8-729-216-22	s	TRANSISTOR 2SA812-M6
R5	1-216-687-11	s	METAL CHIP 33K 0.50% 1/10W
R6	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R38	1-216-693-11	s	METAL CHIP 56K 0.50% 1/10W
R40	1-216-685-11	s	METAL CHIP 27K 0.50% 1/10W
R41	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R42	1-216-689-11	s	METAL CHIP 39K 0.50% 1/10W
R50	1-216-690-11	s	METAL CHIP 43K 0.50% 1/10W
R51	1-216-679-11	s	METAL CHIP 15K 0.50% 1/10W
R76	1-216-695-11	s	METAL CHIP 68K 0.50% 1/10W
R77	1-216-681-11	s	METAL CHIP 18K 0.50% 1/10W
RV1	1-228-460-00	s	METAL 20K
RV2	1-228-460-00	s	METAL 20K
RV3	1-228-460-00	s	METAL 20K
RV4	1-228-459-00	s	METAL 10K
S1	1-570-621-11	s	DIP
S2	1-570-857-11	s	SLIDE
X1	1-577-570-11	s	VIBRATOR, CRYSTAL 7.986MHz

Please see pages D-9 and D-10 for the part numbers of capacitors and resistors that are not listed in the parts list.

MD-54 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7513-876-A	o	MOUNTED CIRCUIT BOARD, MD-54
2pcs	1-561-707-00	o	POLARISING KEY
1pc	3-711-775-01	o	LEVER, PULL
C10	1-107-046-00	s	MICA 4.7PF 0.5PF 500V
C20	1-162-802-11	s	CERAMIC 0.047uF 10% 50V
C24	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C25	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C26	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C28	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C29	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C30	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C31	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C32	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C35	1-162-714-11	s	CERAMIC 150PF 1% 50V
C36	1-162-714-11	s	CERAMIC 150PF 1% 50V
C38	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C39	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C44	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
CN1	1-560-935-00	o	CONNECTOR, 40P, MALE
CV1	1-141-298-11	s	CERAMIC TRIMMER 10P
D1	8-719-100-03	s	DIODE 1S2835
FL1	1-236-274-11	s	LOW PASS 9MHz
IC1	8-759-201-06	s	IC TC4073BF
IC2	8-759-100-93	s	IC UPC323G2
IC3	8-759-200-79	s	IC TC4049BF
IC4	8-759-030-16	s	IC MC34182N
IC5	8-759-208-11	s	IC TC4053BFPHB
IC6	8-759-208-06	s	IC TC4051BFPHB
L1	1-408-413-00	s	22uH
L2	1-408-413-00	s	22uH
L3	1-408-409-00	s	10uH
L4	1-408-409-00	s	10uH
LV1	1-410-301-11	s	MICRO 1.0uH
Q2	8-729-100-66	s	TRANSISTOR 2SC1623
Q3	8-729-100-66	s	TRANSISTOR 2SC1623
Q4	8-729-100-66	s	TRANSISTOR 2SC1623
Q5	8-729-100-66	s	TRANSISTOR 2SC1623
Q6	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q7	8-729-100-66	s	TRANSISTOR 2SC1623
Q8	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q9	8-729-122-63	s	TRANSISTOR 2SA1226
Q10	8-729-122-63	s	TRANSISTOR 2SA1226
Q11	8-769-401-67	s	TRANSISTOR 2SK163-1
Q12	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q13	8-729-200-87	s	TRANSISTOR 2SC2714Y-85L
Q14	8-729-122-63	s	TRANSISTOR 2SA1226
Q15	8-729-200-87	s	TRANSISTOR 2SC2714Y-85L
Q16	8-729-122-63	s	TRANSISTOR 2SA1226
Q17	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q18	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q19	8-729-403-29	s	TRANSISTOR XN6435
Q20	8-729-403-29	s	TRANSISTOR XN6435
Q21	8-729-403-29	s	TRANSISTOR XN6435
R4	1-216-681-11	s	METAL CHIP 18K 0.50% 1/10W

(MD-54 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R6	1-216-681-11	s	METAL CHIP 18K 0.50% 1/10W
R8	1-216-681-11	s	METAL CHIP 18K 0.50% 1/10W
R9	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R10	1-216-681-11	s	METAL CHIP 18K 0.50% 1/10W
R29	1-216-649-11	s	METAL CHIP 820 0.50% 1/10W
R30	1-216-649-11	s	METAL CHIP 820 0.50% 1/10W
R31	1-216-655-11	s	METAL CHIP 1.2K 0.50% 1/10W
R32	1-216-655-11	s	METAL CHIP 1.2K 0.50% 1/10W
R33	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R34	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R35	1-216-656-11	s	METAL CHIP 1.6K 0.5% 1/10W
R37	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R38	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R39	1-216-662-11	s	METAL CHIP 3K 0.50% 1/10W
R43	1-216-670-11	s	METAL CHIP 6.2K 0.50% 1/10W
R44	1-216-674-11	s	METAL CHIP 9.1K 0.50% 1/10W
R48	1-216-698-11	s	METAL CHIP 91K 0.50% 1/10W
R49	1-216-680-11	s	METAL CHIP 18K 0.50% 1/10W
R50	1-216-679-11	s	METAL CHIP 15K 0.50% 1/10W
R52	1-216-668-11	s	METAL CHIP 5.1K 0.50% 1/10W
R53	1-216-671-11	s	METAL CHIP 6.8K 0.50% 1/10W
R54	1-216-623-11	s	METAL CHIP 56 0.50% 1/10W
R56	1-216-689-11	s	METAL CHIP 39K 0.50% 1/10W
R57	1-216-681-11	s	METAL CHIP 18K 0.50% 1/10W
R63	1-216-655-11	s	METAL CHIP 1.5K 0.50% 1/10W
R65	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R67	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R68	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R71	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R72	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R75	1-216-668-11	s	METAL CHIP 5.1K 0.50% 1/10W
R77	1-216-688-11	s	METAL CHIP 36K 0.50% 1/10W
R78	1-216-691-11	s	METAL CHIP 47K 0.50% 1/10W
R79	1-216-659-11	s	METAL CHIP 2.2K 0.50% 1/10W
R80	1-216-659-11	s	METAL CHIP 2.2K 0.50% 1/10W
R93	1-216-681-11	s	METAL CHIP 18K 0.50% 1/10W
R94	1-216-681-11	s	METAL CHIP 18K 0.50% 1/10W
R95	1-216-681-11	s	METAL CHIP 18K 0.50% 1/10W
R96	1-216-674-11	s	METAL CHIP 9.1K 0.50% 1/10W
R97	1-216-633-11	s	METAL CHIP 180 0.50% 1/10W
R98	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
RP1	1-239-024-11	s	MATRIX RESISTOR
RV1	1-228-458-00	s	METAL 5K
RV2	1-228-458-00	s	METAL 5K
RV3	1-228-458-00	s	METAL 5K
RV4	1-228-460-00	s	METAL 20K
RV5	1-228-458-00	s	METAL 5K
RV7	1-228-460-00	s	METAL 20K
RV8	1-228-455-00	s	METAL 500
RV9	1-228-459-00	s	METAL 10K
S1	1-570-610-11	s	TOGGLE
S2	1-570-610-11	s	TOGGLE
S3	1-570-610-11	s	TOGGLE

Please see pages D-9 and D-10 for the part numbers of capacitors and resistors that are not listed in the parts list.

MD-55 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7513-877-A	o	MOUNTED CIRCUIT BOARD, MD-55
1pc	1-216-673-11	s	METAL CHIP 8.2K 0.50% 1/10W
2pcs	1-560-707-00	o	POLARISING KEY
1pc	3-711-775-01	o	LEVER, PULL
C7	1-107-205-00	s	MICA 13PF 5% 500V
C10	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C14	1-162-806-11	s	CERAMIC 0.1uF 10% 50V
C21	1-107-205-00	s	MICA 13PF 5% 500V
C25	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C28	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C30	1-161-473-00	s	CERAMIC 0.01MF 10% 50V
C33	1-162-674-11	s	CERAMIC 39PF 5% 50V
C35	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C36	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C37	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C39	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C40	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C41	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C42	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C43	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C44	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C45	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C46	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C47	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C48	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C49	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C50	1-107-249-00	s	MICA 8.2PF 0.5PF 500V
C51	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C52	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C54	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C55	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C56	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C57	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C58	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C59	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C60	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C61	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C64	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C67	1-163-102-00	s	CERAMIC CHIP 24PF 5% 50V
C68	1-163-102-00	s	CERAMIC CHIP 24PF 5% 50V
CN1	1-560-935-00	o	CONNECTOR, 40P, MALE
CP1	1-577-202-11	s	OSCILLATOR, CRYSTAL 36MHz
FL1	1-236-274-11	s	LOW PASS 9MHz
FL2	1-236-274-11	s	LOW PASS 9MHz
FL3	1-415-436-11	s	36uH
FL4	1-235-570-11	s	BAND PASS 18MHz
FL5	1-236-278-11	s	LOW PASS 36MHz
IC1	8-759-030-16	s	IC MC34182M
IC2	8-759-208-06	s	IC TC4051BPHB
IC3	8-759-208-06	s	IC TC4051BPHB
IC4	8-759-706-05	s	IC NJM78L05A
IC5	8-759-906-71	s	IC T4F175PC
L1	1-408-413-00	s	22uH
L2	1-408-413-00	s	22uH
L3	1-408-413-00	s	22uH
L4	1-408-413-00	s	22uH
L5	1-410-509-11	s	10uH

Please see pages D-9 and D-10 for the part numbers of capacitors and resistors that are not listed in the parts list.

(MD-55 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
L6	1-408-409-00	s	10uH
L7	1-408-409-00	s	10uH
L8	1-408-409-00	s	10uH
L9	1-408-409-00	s	10uH
L10	1-408-409-00	s	10uH
L11	1-412-150-11	s	MICRO INDUCTOR 0.12UH
Q1	8-729-216-22	s	TRANSISTOR 2SA812-M6
Q2	8-729-216-22	s	TRANSISTOR 2SA812-M6
Q3	8-729-216-22	s	TRANSISTOR 2SA812-M6
Q4	8-729-200-87	s	TRANSISTOR 2SC2714Y-85L
Q5	8-729-200-87	s	TRANSISTOR 2SC2714Y-85L
Q6	8-729-100-66	s	TRANSISTOR 2SC1623
Q7	8-729-122-63	s	TRANSISTOR 2SA1226
Q8	8-729-216-22	s	TRANSISTOR 2SA812-M6
Q9	8-769-401-57	s	TRANSISTOR 3SK163-1
Q10	8-729-100-66	s	TRANSISTOR 2SC1623
Q11	8-729-100-66	s	TRANSISTOR 2SC1623
Q12	8-729-200-87	s	TRANSISTOR 2SC2714Y-85L
Q13	8-729-100-66	s	TRANSISTOR 2SC1623
Q14	8-729-200-87	s	TRANSISTOR 2SC2714Y-85L
Q15	8-729-122-63	s	TRANSISTOR 2SA1226
Q16	8-729-216-22	s	TRANSISTOR 2SA812-M6
Q17	8-769-401-57	s	TRANSISTOR 3SK163-1
Q18	8-729-175-71	s	TRANSISTOR 2SC2757-T32
Q19	8-729-175-71	s	TRANSISTOR 2SC2757-T32
Q20	8-729-112-65	s	TRANSISTOR 2SA1462
Q21	8-729-175-71	s	TRANSISTOR 2SC2757-T32
Q22	8-729-112-65	s	TRANSISTOR 2SA1462
Q23	8-729-175-71	s	TRANSISTOR 2SC2757-T32
Q24	8-729-175-71	s	TRANSISTOR 2SC2757-T32
Q25	8-729-175-71	s	TRANSISTOR 2SC2757-T32
Q26	8-729-175-71	s	TRANSISTOR 2SC2757-T32
Q27	8-729-175-71	s	TRANSISTOR 2SC2757-T32
R11	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R12	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R14	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R15	1-216-654-11	s	METAL CHIP 1.3K 0.50% 1/10W
R18	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R19	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R21	1-216-674-11	s	METAL CHIP 9.1K 0.50% 1/10W
R27	1-216-698-11	s	METAL CHIP 91K 0.50% 1/10W
R35	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R36	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R38	1-216-654-11	s	METAL CHIP 1.3K 0.50% 1/10W
R41	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R42	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R43	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R45	1-216-674-11	s	METAL CHIP 9.1K 0.50% 1/10W
R51	1-216-698-11	s	METAL CHIP 91K 0.50% 1/10W
R54	1-216-623-11	s	METAL CHIP 68 0.50% 1/10W
R55	1-216-689-11	s	METAL CHIP 39K 0.50% 1/10W
R57	1-216-681-11	s	METAL CHIP 18K 0.50% 1/10W
R62	1-216-668-11	s	METAL CHIP 5.1K 0.50% 1/10W
R63	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R66	1-216-659-11	s	METAL CHIP 2.2K 0.50% 1/10W
R67	1-216-635-11	s	METAL CHIP 220 0.50% 1/10W
R68	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R69	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W

(MD-55 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R72	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R73	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R74	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R75	1-216-668-11	s	METAL CHIP 36K 0.50% 1/10W
R76	1-216-659-11	s	METAL CHIP 2.2K 0.50% 1/10W
R77	1-216-659-11	s	METAL CHIP 2.2K 0.50% 1/10W
R78	1-216-691-11	s	METAL CHIP 47K 0.50% 1/10W
R79	1-216-659-11	s	METAL CHIP 2.2K 0.50% 1/10W
R80	1-216-635-11	s	METAL CHIP 220 0.50% 1/10W
R81	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R82	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R85	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R86	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R87	1-216-668-11	s	METAL CHIP 36K 0.50% 1/10W
R88	1-216-691-11	s	METAL CHIP 47K 0.50% 1/10W
R89	1-216-659-11	s	METAL CHIP 2.2K 0.50% 1/10W
R90	1-216-659-11	s	METAL CHIP 2.2K 0.50% 1/10W
R91	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R96	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R97	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R102	1-216-668-11	s	METAL CHIP 36K 0.50% 1/10W
R104	1-216-657-11	s	METAL CHIP 1.8K 0.5% 1/10W
R105	1-216-663-11	s	METAL CHIP 3.3K 0.50% 1/10W
R106	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R107	1-216-639-11	s	METAL CHIP 330 0.50% 1/10W
RP1	1-239-025-11	s	MATRIX RESISTOR
RP2	1-239-026-11	s	MATRIX RESISTOR
RV1	1-228-458-00	s	METAL 5K
RV2	1-228-457-00	s	METAL 2K
RV4	1-228-458-00	s	METAL 5K
RV7	1-228-456-00	s	METAL 1K
RV8	1-228-459-00	s	METAL 10K
RV9	1-228-456-00	s	METAL 1K
RV10	1-228-459-00	s	METAL 10K
RV11	1-228-457-00	s	METAL 2K
RV12	1-228-454-00	s	METAL 200

RX-6 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7513-874-A	o	MOUNTED CIRCUIT BOARD, RX-6
2pcs	1-560-707-00	o	POLARISING KEY
1pc	3-711-775-01	o	LEVER, PULL
C2	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C4	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C5	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C7	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C8	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C10	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C11	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C19	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C24	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C27	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C28	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C30	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C32	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C34	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C37	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C38	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C46	1-106-367-00	s	MYLAR 0.01MF 5% 200V
C48	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C49	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C51	1-124-225-00	s	ELECT 100MF 20% 6.3V
C52	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C54	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C63	1-163-066-00	s	CERAMIC CHIP 3PF 0.25PF 50V
C64	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C65	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C66	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C67	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
CN1	1-560-935-00	o	CONNECTOR, 40P, MALE
CP1	1-464-758-11	s	DC-DC CONVERTER (CD-54)
D1	8-719-945-91	s	DIODE 1T33
D2	8-719-945-91	s	DIODE 1T33
D3	8-719-945-91	s	DIODE 1T33
D4	8-719-945-91	s	DIODE 1T33
D5	8-719-109-97	s	DIODE RD6.8ES-B2
D6	8-719-109-97	s	DIODE RD6.8ES-B2
D7	8-719-118-38	s	DIODE 1SZ46A
D8	8-719-101-50	s	DIODE RD5.1E-L2
D9	8-719-101-97	s	DIODE 1SS97-1
FL1	1-236-272-11	s	BAND PASS 70MHz
FL2	1-236-277-11	s	LOW PASS 4MHz
IC1	8-759-927-85	s	IC CA3102E-S
IC2	8-752-032-63	s	IC CXA1165M
IC3	8-759-908-17	s	IC TL082CPS
L1	1-422-595-11	s	COIL, AIR CORE
L2	1-410-322-11	s	3.3uH
L3	1-408-413-00	s	22uH
L4	1-408-413-00	s	22uH
L5	1-408-413-00	s	22uH
L6	1-408-409-00	s	10uH
L7	1-408-409-00	s	10uH
L8	1-408-413-00	s	22uH
L9	1-408-413-00	s	22uH
L10	1-408-413-00	s	22uH

Please see pages D-9 and D-10 for the part numbers of capacitors and resistors that are not listed in the parts list.

(RX-6 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
L11	1-408-413-00	s	22uH
LV1	1-410-350-11	s	MICRO 0.6uH
LV2	1-410-296-11	s	MICRO 0.2uH
Q1	8-729-119-27	s	TRANSISTOR 2SC2758-U17
Q2	8-729-119-27	s	TRANSISTOR 2SC2758-U17
Q3	8-729-119-27	s	TRANSISTOR 2SC2758-U17
Q4	8-729-266-83	s	TRANSISTOR 2SC2668
Q5	8-729-105-47	s	TRANSISTOR 2SC2026-L
Q6	8-729-105-47	s	TRANSISTOR 2SC2026-L
Q7	8-729-600-28	s	TRANSISTOR 2SC945-K
Q8	8-729-266-83	s	TRANSISTOR 2SC2668
Q9	8-729-119-76	s	TRANSISTOR 2SA1175-E
Q10	8-729-177-32	s	TRANSISTOR 2SD773
Q11	8-729-216-22	s	TRANSISTOR 2SA812-M6
Q12	8-729-122-63	s	TRANSISTOR 2SA1226
Q13	8-729-101-25	s	TRANSISTOR 2SC1009A
Q14	8-729-122-63	s	TRANSISTOR 2SA1226
Q15	8-729-101-25	s	TRANSISTOR 2SC1009A
Q16	8-729-101-25	s	TRANSISTOR 2SC1009A
Q17	8-729-101-25	s	TRANSISTOR 2SC1009A
Q18	8-729-101-25	s	TRANSISTOR 2SC1009A
Q19	8-729-122-63	s	TRANSISTOR 2SA1226
Q20	8-729-900-53	s	TRANSISTOR DTC114EK
Q21	8-729-900-53	s	TRANSISTOR DTC114EK
R1	1-216-647-11	s	METAL CHIP 680 0.50% 1/10W
R19	1-216-640-11	s	METAL CHIP 360 0.50% 1/10W
R27	1-216-646-11	s	METAL CHIP 620 0.50% 1/10W
R30	1-216-665-11	s	METAL CHIP 4.3K 0.50% 1/10W
R35	1-216-666-11	s	METAL CHIP 4.3K 0.50% 1/10W
R41	1-214-098-00	s	METAL 39 1% 1/4W
R44	1-216-655-11	s	METAL CHIP 1.5K 0.50% 1/10W
R47	1-216-627-11	s	METAL CHIP 100 0.50% 1/10W
R48	1-216-660-11	s	METAL CHIP 2.4K 0.50% 1/10W
R50	1-216-627-11	s	METAL CHIP 100 0.50% 1/10W
R51	1-216-662-11	s	METAL CHIP 3K 0.50% 1/10W
R53	1-216-660-11	s	METAL CHIP 2.4K 0.50% 1/10W
R58	1-216-673-11	s	METAL CHIP 8.2K 0.50% 1/10W
R59	1-216-682-11	s	METAL CHIP 20K 0.50% 1/10W
R60	1-216-681-11	s	METAL CHIP 18K 0.50% 1/10W
R61	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R62	1-216-659-11	s	METAL CHIP 2.2K 0.50% 1/10W
R65	1-216-624-11	s	METAL CHIP 75 0.50% 1/10W
R67	1-216-662-11	s	METAL CHIP 3K 0.50% 1/10W
R82	1-216-655-11	s	METAL CHIP 1.5K 0.50% 1/10W
R83	1-216-664-11	s	METAL CHIP 3.6K 0.50% 1/10W
RV1	1-228-455-00	s	METAL 500
RV2	1-228-457-00	s	METAL 2K
S1	1-570-610-11	s	TOGGLE
T1	1-417-171-11	s	COIL, BALUNE
T2	1-417-171-11	s	COIL, BALUNE

SW-44 BOARD

Ref. No. or Q'ty	Part No.	SP	Description

SW-312 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-628-369-11	o	PRINTED CIRCUIT BOARD, SW-312
C1	1-124-927-11	s	ELECT 4.7MF 20% 100V
C2	1-124-927-11	s	ELECT 4.7MF 20% 100V
C3	1-124-927-11	s	ELECT 4.7MF 20% 100V
CN301	1-506-468-11	o	CONNECTOR, 3P, MALE
CN302	1-506-470-11	o	CONNECTOR, 5P, MALE
CN303	1-506-468-11	o	CONNECTOR, 3P, MALE
CN304	1-506-474-11	o	CONNECTOR, 9P, MALE
R1	1-249-425-11	s	CARBON 4.7K 5% 1/4W
R2	1-249-425-11	s	CARBON 4.7K 5% 1/4W
R3	1-247-903-00	s	CARBON 1M 5% 1/4W
R4	1-247-903-00	s	CARBON 1M 5% 1/4W
R5	1-249-417-11	s	CARBON 1K 5% 1/4W

Please see pages D-9 and D-10 for the part numbers of capacitors and resistors that are not listed in the parts list.

TR-47 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7513-875-A	o	MOUNTED CIRCUIT BOARD, TR-47
2pcs	1-560-707-00	o	POLARISING KEY
1pc	3-711-775-01	o	LEVER, PULL
C10	1-101-361-00	s	CERAMIC 39PF 5% 50V
C15	1-126-163-11	s	ELECT 4.7MF 20% 50V
C16	1-124-499-11	s	ELECT 1MF 20% 50V
C17	1-124-499-11	s	ELECT 1MF 20% 50V
C22	1-124-292-00	s	ELECT 33MF 20% 6.3V
C32	1-102-816-00	s	CERAMIC 120PF 5% 50V
C33	1-163-131-00	s	CERAMIC CHIP 390PF 5% 50V
C38	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C48	1-163-119-00	s	CERAMIC CHIP 120PF 5% 50V
C51	1-101-884-00	s	CERAMIC 56PF 5% 50V
C52	1-163-131-00	s	CERAMIC CHIP 390PF 5% 50V
C72	1-163-131-00	s	CERAMIC CHIP 390PF 5% 50V
C73	1-163-139-00	s	CERAMIC CHIP 820PF 5% 50V
C75	1-102-959-00	s	CERAMIC 22PF 5% 50V
C76	1-101-880-00	s	CERAMIC 47PF 5% 50V
C81	1-163-135-00	s	CERAMIC CHIP 560PF 5% 50V
C93	1-102-955-00	s	CERAMIC 22PF 5% 50V
C94	1-101-361-00	s	CERAMIC 39PF 5% 50V
C99	1-163-135-00	s	CERAMIC CHIP 560PF 5% 50V
C104	1-163-123-00	s	CERAMIC CHIP 180PF 5% 50V
C105	1-162-767-11	s	CERAMIC 0.0015MF 5% 50V
C108	1-101-361-00	s	CERAMIC 39PF 5% 50V
C109	1-101-888-00	s	CERAMIC 68PF 5% 50V
C114	1-163-135-00	s	CERAMIC CHIP 560PF 5% 50V
C116	1-163-135-00	s	CERAMIC CHIP 560PF 5% 50V
C118	1-101-361-00	s	CERAMIC 39PF 5% 50V
C119	1-101-884-00	s	CERAMIC 56PF 5% 50V
C124	1-163-135-00	s	CERAMIC CHIP 560PF 5% 50V
C129	1-163-120-00	s	CERAMIC CHIP 130PF 5% 50V
C131	1-163-118-00	s	CERAMIC CHIP 110PF 5% 50V
C135	1-163-122-00	s	CERAMIC 160PF 5% 50V
CF1	1-577-208-11	s	CERAMIC, 6.2MHz
CF2	1-577-209-11	s	CERAMIC, 6.8MHz
CF3	1-577-207-11	s	FILTER, CERAMIC
CF4	1-577-365-11	s	FILTER, CERAMIC
CF5	1-577-206-11	s	CERAMIC, 4.5MHz
CF6	1-577-203-11	s	CERAMIC, 3.5MHz
CF7	1-577-204-11	s	CERAMIC, 3.5MHz
CN1	1-560-935-00	o	CONNECTOR, 40P, MALE
D1	8-719-800-76	s	DIODE 1SS123
D2	8-719-800-76	s	DIODE 1SS123
D3	8-719-100-05	s	DIODE 1SZ837
D4	8-719-100-03	s	DIODE 1SZ835
D5	8-719-800-76	s	DIODE 1SS123
D6	8-719-800-76	s	DIODE 1SS123
D7	8-719-949-35	s	DIODE PC53M-6
D8	8-719-800-76	s	DIODE 1SS123
D9	8-719-800-76	s	DIODE 1SS123
D10	8-719-800-76	s	DIODE 1SS123
D11	8-719-101-67	s	DIODE RD7.5E-L2
D12	8-719-800-76	s	DIODE 1SS123
D13	8-719-800-76	s	DIODE 1SS123
D14	8-719-949-35	s	DIODE PC53M-6
D15	8-719-800-76	s	DIODE 1SS123

(TR-47 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
D16	8-719-101-87	s	DIODE 1SS97-1
D17	8-719-100-53	s	DIODE 1SS235
D18	8-719-101-58	s	DIODE RD5.6EL2
D19	8-719-800-76	s	DIODE 1SS123
D20	8-719-913-44	s	DIODE ERA82-004
D21	8-719-948-47	s	DIODE HSM88AS
D22	8-719-948-47	s	DIODE HSM88AS
D23	8-719-949-35	s	DIODE PC53M-6
D24	8-719-911-19	s	DIODE 1SS119
FL1	1-236-273-11	s	LOW PASS 4.9MHz
IC1	8-759-209-15	s	IC TC4S066F
IC2	8-759-981-98	s	IC RC4560M
IC3	8-759-981-98	s	IC RC4560M
IC4	8-759-981-86	s	IC RC4556MA
IC5	8-759-201-36	s	IC TA7303P
IC6	8-759-981-86	s	IC RC4556MA
IC7	8-759-201-36	s	IC TA7303P
IC8	8-759-908-17	s	IC TL082CPS
IC9	8-759-201-36	s	IC TA7303P
IC10	8-759-030-15	s	IC MC34182M
IC11	8-759-201-36	s	IC TA7303P
L1	1-410-509-11	s	10uH
L2	1-410-509-11	s	10uH
L3	1-410-509-11	s	10uH
L4	1-410-513-11	s	22uH
L5	1-410-509-11	s	10uH
L6	1-410-513-11	s	22uH
L7	1-410-509-11	s	10uH
L8	1-410-509-11	s	10uH
L9	1-410-509-11	s	10uH
L10	1-410-509-11	s	10uH
L11	1-410-509-11	s	10uH
L12	1-410-509-11	s	10uH
L13	1-410-509-11	s	10uH
L14	1-410-509-11	s	10uH
LV1	1-459-890-11	s	COIL, VARIABLE
LV2	1-459-888-11	s	COIL, VARIABLE
LV3	1-459-889-11	s	COIL, VARIABLE
LV4	1-459-891-11	s	COIL, VARIABLE
LV5	1-459-891-11	s	COIL, VARIABLE
LV6	1-459-881-11	s	COIL, VARIABLE
LV7	1-459-881-11	s	COIL, VARIABLE
Q1	8-729-216-22	s	TRANSISTOR 2SA812-M6
Q2	8-729-600-28	s	TRANSISTOR 2SC945-K
Q3	8-729-100-66	s	TRANSISTOR 2SC1623
Q4	8-729-200-87	s	TRANSISTOR 2SC2714Y-85L
Q5	8-729-119-04	s	TRANSISTOR 2SC3115-DZ7
Q6	8-729-119-04	s	TRANSISTOR 2SC3115-DZ7
Q7	8-729-119-04	s	TRANSISTOR 2SC3115-DZ7
Q8	8-729-119-04	s	TRANSISTOR 2SC3115-DZ7
Q9	8-729-100-66	s	TRANSISTOR 2SC1623
Q10	8-729-216-22	s	TRANSISTOR 2SA812-M6
Q11	8-729-100-66	s	TRANSISTOR 2SC1623
Q12	8-729-101-25	s	TRANSISTOR 2SC1009A
Q13	8-729-200-87	s	TRANSISTOR 2SC2714Y-85L
Q14	8-729-100-66	s	TRANSISTOR 2SC1623
Q15	8-729-100-66	s	TRANSISTOR 2SC1623

Please see pages D-9 and D-10 for the part numbers of capacitors and resistors that are not listed in the parts list.

(TR-47 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
Q16	8-729-100-66	s	TRANSISTOR 2SC1623
Q17	8-729-101-25	s	TRANSISTOR 2SC1009A
Q18	8-729-200-87	s	TRANSISTOR 2SC2714Y-85L
Q19	8-729-200-87	s	TRANSISTOR 2SC2714Y-85L
Q20	8-729-122-63	s	TRANSISTOR 2SA1226
Q21	8-729-200-87	s	TRANSISTOR 2SC2714Y-85L
Q22	8-729-122-63	s	TRANSISTOR 2SA1226
Q23	8-729-200-87	s	TRANSISTOR 2SC2714Y-85L
Q24	8-729-122-63	s	TRANSISTOR 2SA1226
Q25	8-729-216-22	s	TRANSISTOR 2SA812-M6
Q26	8-729-100-66	s	TRANSISTOR 2SC1623
Q27	8-729-100-66	s	TRANSISTOR 2SC1623
Q28	8-729-122-63	s	TRANSISTOR 2SA1226
Q29	8-729-122-63	s	TRANSISTOR 2SA1226
Q30	8-729-100-66	s	TRANSISTOR 2SC1623
Q31	8-729-100-66	s	TRANSISTOR 2SC1623
Q32	8-729-100-66	s	TRANSISTOR 2SC1623
Q33	8-729-122-63	s	TRANSISTOR 2SA1226
Q34	8-729-122-63	s	TRANSISTOR 2SA1226
Q35	8-729-216-22	s	TRANSISTOR 2SA812-M6
Q36	8-729-216-22	s	TRANSISTOR 2SA812-M6
Q37	8-729-100-66	s	TRANSISTOR 2SC1623
Q38	8-729-122-63	s	TRANSISTOR 2SA1226
Q39	8-729-122-63	s	TRANSISTOR 2SA1226
Q40	8-729-122-63	s	TRANSISTOR 2SA1226
Q41	8-729-122-63	s	TRANSISTOR 2SA1226
R6	1-216-748-11	s	METAL CHIP 39K 5% 1/10W
R7	1-216-684-11	s	METAL CHIP 24K 0.50% 1/10W
R8	1-216-687-11	s	METAL CHIP 33K 0.50% 1/10W
R10	1-216-673-11	s	METAL CHIP 8.2K 0.50% 1/10W
R12	1-216-659-11	s	METAL CHIP 2.2K 0.50% 1/10W
R16	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R19	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R22	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R23	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R25	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R26	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R29	1-216-611-11	s	METAL CHIP 22 0.5% 1/10W
R30	1-216-611-11	s	METAL CHIP 22 0.5% 1/10W
R33	1-216-679-11	s	METAL CHIP 15K 0.50% 1/10W
R34	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R35	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R36	1-216-669-11	s	METAL CHIP 5.6K 0.50% 1/10W
R37	1-216-669-11	s	METAL CHIP 5.6K 0.50% 1/10W
R39	1-216-679-11	s	METAL CHIP 15K 0.50% 1/10W
R41	1-216-682-11	s	METAL CHIP 20K 0.50% 1/10W
R42	1-216-669-11	s	METAL CHIP 5.6K 0.50% 1/10W
R43	1-216-669-11	s	METAL CHIP 5.6K 0.50% 1/10W
R44	1-216-682-11	s	METAL CHIP 20K 0.50% 1/10W
R48	1-216-677-11	s	METAL CHIP 12K 0.50% 1/10W
R49	1-216-681-11	s	METAL CHIP 18K 0.50% 1/10W
R50	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R51	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R52	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R53	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R51	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R64	1-216-643-11	s	METAL CHIP 470 0.50% 1/10W
R65	1-216-655-11	s	METAL CHIP 1.5K 0.50% 1/10W

Please see pages D-9 and D-10 for the part numbers of capacitors and resistors that are not listed in the parts list.

(TR-47 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R70	1-216-655-11	s	METAL CHIP 1.5K 0.50% 1/10W
R73	1-216-655-11	s	METAL CHIP 1.5K 0.50% 1/10W
R83	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R85	1-216-678-11	s	METAL CHIP 13K 0.50% 1/10W
R86	1-216-683-11	s	METAL CHIP 22K 0.50% 1/10W
R87	1-216-687-11	s	METAL CHIP 33K 0.50% 1/10W
R88	1-216-679-11	s	METAL CHIP 15K 0.50% 1/10W
R89	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R97	1-216-646-11	s	METAL CHIP 620 0.50% 1/10W
R100	1-216-646-11	s	METAL CHIP 620 0.50% 1/10W
R110	1-216-624-11	s	METAL CHIP 75 0.50% 1/10W
R115	1-249-393-11	s	CARBON 10 5% 1/4W
R123	1-216-687-11	s	METAL CHIP 33K 0.50% 1/10W
R124	1-216-687-11	s	METAL CHIP 33K 0.50% 1/10W
R129	1-216-748-11	s	METAL CHIP 39K 5% 1/10W
R133	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R134	1-216-659-11	s	METAL CHIP 2.2K 0.50% 1/10W
R139	1-216-627-11	s	METAL CHIP 100 0.50% 1/10W
R140	1-216-627-11	s	METAL CHIP 100 0.50% 1/10W
R149	1-249-393-11	s	CARBON 10 5% 1/4W
R160	1-216-748-11	s	METAL CHIP 39K 5% 1/10W
R164	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R165	1-216-659-11	s	METAL CHIP 2.2K 0.50% 1/10W
R169	1-216-627-11	s	METAL CHIP 100 0.50% 1/10W
R170	1-216-627-11	s	METAL CHIP 100 0.50% 1/10W
R171	1-216-646-11	s	METAL CHIP 620 0.50% 1/10W
R174	1-216-646-11	s	METAL CHIP 620 0.50% 1/10W
R177	1-216-691-11	s	METAL CHIP 47K 0.50% 1/10W
R178	1-216-691-11	s	METAL CHIP 47K 0.50% 1/10W
R188	1-216-675-11	s	METAL CHIP 10K 0.50% 1/10W
R192	1-216-627-11	s	METAL CHIP 100 0.50% 1/10W
R193	1-216-627-11	s	METAL CHIP 100 0.50% 1/10W
R2202	1-216-688-11	s	METAL CHIP 36K 0.50% 1/10W
R2207	1-216-627-11	s	METAL CHIP 100 0.50% 1/10W
R208	1-216-627-11	s	METAL CHIP 100 0.50% 1/10W
R214	1-216-659-11	s	METAL CHIP 2.2K 0.50% 1/10W
RV1	1-228-456-00	s	METAL 1K
RV2	1-228-459-00	s	METAL 10K
RV3	1-228-456-00	s	METAL 1K
RV4	1-228-459-00	s	METAL 10K
RV5	1-228-457-00	s	METAL 2K
RV6	1-228-460-00	s	METAL 20K
RV7	1-228-460-00	s	METAL 20K
RV8	1-228-460-00	s	METAL 20K
S1	1-570-612-11	s	TOGGLE
S2	1-570-838-11	s	SLIDE
X1	1-527-990-00	s	32.768KHz

VA-80 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7513-898-A	o	MOUNTED CIRCUIT BOARD, VA-80
3pcs	3-669-596-00	s	WASHER (2.3), STOPPER
C3	1-107-040-00	s	MICA 1.5PF 0.5PF 500V
C4	1-107-045-00	s	MICA 3.9PF 0.5PF 500V
C7	1-107-040-00	s	MICA 1.5PF 0.5PF 500V
C8	1-107-045-00	s	MICA 3.9PF 0.5PF 500V
C11	1-107-040-00	s	MICA 1.5PF 0.5PF 500V
C12	1-107-045-00	s	MICA 3.9PF 0.5PF 500V
C15	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C16	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C19	1-107-047-00	s	MICA 5.6PF 0.5PF 500V
C20	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C22	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
C38	1-107-042-00	s	MICA 2.2PF 0.5PF 500V
C40	1-107-045-00	s	MICA 3.9PF 0.5PF 500V
C41	1-163-115-00	s	CERAMIC CHIP 82PF 5% 50V
C42	1-163-115-00	s	CERAMIC CHIP 82PF 5% 50V
C47	1-163-135-00	s	CERAMIC CHIP 560PF 5% 50V
C48	1-163-135-00	s	CERAMIC CHIP 560PF 5% 50V
C49	1-162-775-11	s	CERAMIC 0.0047MF 5% 50V
C50	1-162-775-11	s	CERAMIC 0.0047MF 5% 50V
C53	1-164-232-11	s	CERAMIC CHIP 0.01MF 20% 100V
CN201	1-506-730-11	o	CONNECTOR, 40P, MALE
CN202	1-506-731-11	o	CONNECTOR, 40P, MALE
CN203	1-506-490-21	o	CONNECTOR, 11P, MALE
CN204	1-506-485-11	o	CONNECTOR, 6P, MALE
CN205	1-506-484-31	o	CONNECTOR, 5P, MALE
D1	8-719-109-66	s	DIODE RD3.3ES-B2
D2	8-719-101-50	s	DIODE RD5.1E-L2
D3	8-719-100-05	s	DIODE 1S2837
D4	8-719-119-59	s	DIODE 1SJ471
D5	8-719-100-05	s	DIODE 1S2837
D6	8-719-100-05	s	DIODE 1S2837
D7	8-719-100-05	s	DIODE 1S2837
D8	8-719-100-05	s	DIODE 1S2837
D9	8-719-100-03	s	DIODE 1S2835
D10	8-719-100-03	s	DIODE 1S2835
D11	8-719-110-22	s	DIODE RD11EB1
D12	8-719-101-97	s	DIODE 1SS97-1
IC1	8-759-030-16	s	IC MC34182M
IC2	8-759-008-07	s	IC MC14053BF
IC3	8-759-100-33	s	IC UPC3362
IC4	8-759-708-05	s	IC NJM78L05A
IC5	8-759-200-90	s	IC TC4538BF
IC6	8-759-205-78	s	IC TC504013BF
IC7	8-759-200-90	s	IC TC4538BF
L1	1-408-417-21	s	47uH
L2	1-408-417-21	s	47uH
L3	1-408-417-21	s	47uH
L4	1-408-417-21	s	47uH
L5	1-408-417-21	s	47uH
L6	1-408-417-21	s	47uH
L8	1-408-420-00	s	82uH
Q1	8-729-122-63	s	TRANSISTOR 2SA1226
Q2	8-729-122-63	s	TRANSISTOR 2SA1226
Q3	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q4	8-729-122-63	s	TRANSISTOR 2SA1226

Please see pages D-9 and D-10 for the part numbers of capacitors and resistors that are not listed in the parts list.

(VA-80 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
Q5	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q6	8-729-122-63	s	TRANSISTOR 2SA1226
Q7	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q8	8-729-122-63	s	TRANSISTOR 2SA1226
Q9	8-729-122-63	s	TRANSISTOR 2SA1226
Q10	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q11	8-729-122-63	s	TRANSISTOR 2SA1226
Q12	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q13	8-729-122-63	s	TRANSISTOR 2SA1226
Q14	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q15	8-729-122-63	s	TRANSISTOR 2SA1226
Q16	8-729-122-63	s	TRANSISTOR 2SA1226
Q17	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q18	8-729-122-63	s	TRANSISTOR 2SA1226
Q19	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q20	8-729-122-63	s	TRANSISTOR 2SA1226
Q21	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q22	8-729-101-25	s	TRANSISTOR 2SC1009A
Q23	8-729-100-66	s	TRANSISTOR 2SC1623
Q24	8-729-101-25	s	TRANSISTOR 2SC1009A
Q25	8-729-101-25	s	TRANSISTOR 2SC1009A
Q26	8-729-101-25	s	TRANSISTOR 2SC1009A
Q27	8-729-216-22	s	TRANSISTOR 2SA812-M6
Q28	8-729-101-25	s	TRANSISTOR 2SC1009A
Q29	8-729-216-22	s	TRANSISTOR 2SA812-M6
Q30	8-729-100-66	s	TRANSISTOR 2SC1623
Q31	8-729-100-66	s	TRANSISTOR 2SC1623
Q32	8-729-216-22	s	TRANSISTOR 2SA812-M6
Q33	8-729-100-66	s	TRANSISTOR 2SC1623
Q34	8-729-100-66	s	TRANSISTOR 2SC1623
Q35	8-729-100-66	s	TRANSISTOR 2SC1623
Q38	8-729-122-63	s	TRANSISTOR 2SA1226
Q39	8-729-122-63	s	TRANSISTOR 2SA1226
Q40	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q41	8-729-122-63	s	TRANSISTOR 2SA1226
Q42	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q43	8-729-122-63	s	TRANSISTOR 2SA1226
Q44	8-729-175-72	s	TRANSISTOR 2SC2757-T33
Q45	8-729-101-25	s	TRANSISTOR 2SC1009A
Q46	8-729-122-63	s	TRANSISTOR 2SA1226
Q47	8-729-101-25	s	TRANSISTOR 2SC1009A
Q48	8-729-100-66	s	TRANSISTOR 2SC1623
Q49	8-729-100-66	s	TRANSISTOR 2SC1623
Q50	8-729-100-66	s	TRANSISTOR 2SC1623
Q51	8-729-100-66	s	TRANSISTOR 2SC1623
Q52	8-729-100-66	s	TRANSISTOR 2SC1623
Q53	8-729-216-22	s	TRANSISTOR 2SA812-M6
R1	1-216-654-11	s	METAL CHIP 1.3K 0.50% 1/10W
R4	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R5	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R6	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R11	1-216-624-11	s	METAL CHIP 75 0.50% 1/10W
R12	1-216-654-11	s	METAL CHIP 1.3K 0.50% 1/10W
R15	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R16	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R17	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R22	1-216-624-11	s	METAL CHIP 75 0.50% 1/10W
R23	1-216-654-11	s	METAL CHIP 1.3K 0.50% 1/10W

(VA-80 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R26	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R27	1-216-644-11	s	METAL CHIP 510 0.50% 1/10W
R28	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R33	1-216-624-11	s	METAL CHIP 75 0.50% 1/10W
R34	1-216-624-11	s	METAL CHIP 75 0.50% 1/10W
R38	1-216-665-11	s	METAL CHIP 3.9K 0.50% 1/10W
R41	1-216-672-11	s	METAL CHIP 7.5K 0.50% 1/10W
R43	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R48	1-216-624-11	s	METAL CHIP 75 0.50% 1/10W
R64	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R65	1-216-674-11	s	METAL CHIP 9.1K 0.50% 1/10W
R66	1-216-681-11	s	METAL CHIP 18K 0.50% 1/10W
R67	1-216-645-11	s	METAL CHIP 560 0.50% 1/10W
R77	1-216-654-11	s	METAL CHIP 1.3K 0.50% 1/10W
R80	1-216-659-11	s	METAL CHIP 2.2K 0.50% 1/10W
R81	1-216-659-11	s	METAL CHIP 2.2K 0.50% 1/10W
R82	1-216-667-11	s	METAL CHIP 4.7K 0.50% 1/10W
R87	1-216-624-11	s	METAL CHIP 75 0.50% 1/10W
R88	1-216-649-11	s	METAL CHIP 820 0.50% 1/10W
R89	1-216-651-11	s	METAL CHIP 1K 0.50% 1/10W
R91	1-216-624-11	s	METAL CHIP 75 0.50% 1/10W
R93	1-216-697-11	s	METAL CHIP 82K 0.50% 1/10W
R94	1-216-678-11	s	METAL CHIP 13K 0.50% 1/10W
R95	1-216-687-11	s	METAL CHIP 33K 0.50% 1/10W
R96	1-216-695-11	s	METAL CHIP 68K 0.50% 1/10W
R115	1-216-665-11	s	METAL CHIP 3.9K 0.50% 1/10W
RV1	1-228-455-00	s	METAL 500
RV2	1-228-455-00	s	METAL 500
RV3	1-228-455-00	s	METAL 500
RV4	1-228-459-00	s	METAL 10K
RV5	1-228-455-00	s	METAL 500
RV6	1-228-460-00	s	METAL 20K
RV7	1-228-458-00	s	METAL 5K
RV8	1-228-461-00	s	METAL 50K
RV9	1-228-461-00	s	METAL 50K
S1	1-571-975-31	s	SWITCH, CHIP
T1	1-427-270-XX	s	TRANSFORMER,OUTPUT

FRAME

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-236-279-31	s	FILTER, MPX
1pc	1-560-163-00	s	PLUG, RF
1pc	1-935-906-21	s	HARNESS (CCD COAX)
C2	1-106-220-00	s	MYLAR 0.1MF 5% 100V
CB1	1-532-681-00	s	CIRCUIT BREAKER
CN1F(to FL-70 board)			
	1-560-764-21	o	PLUG CONTACT
	1-561-875-00	o	CONNECTOR 2P
CN1M	1-563-907-11	s	CONNECTOR, FEMALE 50P "CAMERA"
CN2M	1-561-781-21	s	CONNECTOR, BNC, FEMALE "RET OUT"
CN3M	1-561-781-21	s	CONNECTOR, BNC, FEMALE "GENLOCK IN"
CN4M	1-565-072-11	s	CONNECTOR, 4P, FEMALE "DC OUT 10.5V
CN5M	1-565-800-11	o	CONNECTOR, FEMALE 5P "DC OUT 120V"
CN6M	1-561-233-21	s	CONNECTOR, 6P, FEMALE "RET OUT"
CN8K	1-562-244-00	o	CONNECTOR, 26P, MALE "VTR"
CN8N	1-565-906-11	s	CONNECTOR, 4P, MALE "DC IN 10.5V-17
CN10M	1-509-184-31	s	CONNECTOR, 3P FEMALE "MIC IN"
CN11M	1-561-844-00	s	CONNECTOR, COAXIAL, FEMALE "CCU"
CN107F(to HN-106 board)			
	1-562-152-11	o	PLUG HOUSING, 7P
	1-563-088-11	o	PLUG CONTACT, FEMALE, AWG24-30
CN108F(to HN-106 board)			
	1-562-185-00	o	PLUG HOUSING, FEMALE, 14P
	1-563-088-11	o	PLUG CONTACT, FEMALE, AWG24-30
CN110F(to HN-106 board)			
	1-562-149-11	o	PLUG HOUSING, 4P
	1-563-088-11	o	PLUG CONTACT, FEMALE, AWG24-30
CN111F(to HN-106 board)			
	1-562-151-11	o	PLUG HOUSING, 6P
	1-563-088-11	o	PLUG CONTACT, FEMALE, AWG24-30
CN112F(to HN-106 board)			
	1-562-147-11	o	PLUG HOUSING, 2P
	1-563-088-11	o	PLUG CONTACT, FEMALE, AWG24-30
CN113F(to HN-106 bOARD)			
	1-562-149-11	o	PLUG HOUSING, 4P
	1-563-088-11	o	PLUG CONTACT, FEMALE, AWG24-30
CN114F(to HN-106 board)			
	1-562-151-11	o	PLUG HOUSING, 6P
	1-563-088-11	o	PLUG CONTACT, FEMALE, AWG24-30
CN115F(to HN-106 bOARD)			
	1-562-150-21	o	HOUSING, CONNECTOR 5P
	1-563-088-11	o	PLUG CONTACT, FEMALE, AWG24-30
CN116F(to HN-106 bOARD)			
	1-562-150-11	o	PLUG HOUSING, 5P
	1-563-088-11	o	PLUG CONTACT, FEMALE, AWG24-30
CN119F(to HN-106 board)			
	1-562-119-11	o	CONNECTOR, PS 10P
	1-563-115-11	o	CONTACT, FEMALE, AWG24-28
CN120F(to HN-106 board)			
	1-562-118-11	o	PLUG HOUSING, 8P
	1-563-115-11	o	PLUG CONTACT, FEMALE, AWG24-28
CN121F(to HN-106 board)			
	1-562-147-11	o	PLUG HOUSING, 2P
	1-563-008-11	o	CONTACT, FEMALE, AWG24-30
CN122F(to HN-106 board)			
	1-562-153-11	o	PLUG HOUSING, 8P
	1-563-088-11	o	PLUG CONTACT, FEMALE, AWG24-30
CN123F(to HN-106 bOARD)			
	1-562-150-11	o	PLUG HOUSING, 5P
	1-563-008-11	o	CONTACT, FEMALE, AWG24-30

Please see pages D-9 and D-10 for the part numbers of capacitors and resistors that are not listed in the parts list.

(FRAME)

Ref. No. or Q'ty	Part No.	SP	Description
CN124F(to HN-106 board)			
	1-562-150-11	o	PLUG HOUSING. 5P
	1-563-088-11	o	PLUG CONTACT. FEMALE. AWG24-30
CN125F(to HN-106 bOARD)			
	1-562-151-11	o	PLUG HOUSING. 6P
	1-563-008-11	o	CONTACT. FEMALE. AWG24-30
CN203F(to VA-80 board)			
	1-562-158-11	o	PLUG HOUSING. 11P
	1-563-088-11	o	PLUG CONTACT. FEMALE. AWG24-30
CN204F(to VA-80 board)			
	1-562-151-11	o	PLUG HOUSING. 6P
	1-563-088-11	o	PLUG CONTACT. FEMALE. AWG24-30
CN205F(to VA-80 board)			
	1-562-150-21	o	HOUSING. CONNECTOR 5P
	1-563-008-11	o	CONTACT. FEMALE. AWG24-30
CN301F(to HN-106 board)			
	1-562-148-11	o	PLUG HOUSING. 3P
	1-563-088-11	o	PLUG CONTACT. FEMALE. AWG24-30
CN303F(to SW-312 board)			
	1-562-148-11	o	PLUG HOUSING. 3P
	1-563-088-11	o	PLUG CONTACT. FEMALE. AWG24-30
CN304F(to SW-312 board)			
	1-562-154-11	o	PLUG HOUSING. 9P
	1-563-008-11	o	CONTACT. FEMALE. AWG24-30
CN501F(to DC-43 board)			
	1-562-147-11	o	PLUG HOUSING. 2P
	1-563-088-11	o	PLUG CONTACT. FEMALE. AWG24-30
CN502F(to DC-42 board)			
	1-563-116-11	o	PLUG HOUSING. 4P
	1-563-115-11	o	CONTACT. FEMALE. AWG24-28
CN504F(to DC-42 board)			
	1-563-117-11	o	PLUG HOUSING. 6P
	1-563-115-11	o	PLUG CONTACT. FEMALE. AWG24-28
CN601F(to DC-43 board)			
	1-563-116-11	o	PLUG HOUSING. 4P
	1-563-115-11	o	PLUG CONTACT. FEMALE. AWG24-28
CN602F(to DC-43 board)			
	1-563-118-11	o	PLUG HOUSING. 8P
	1-563-115-11	o	PLUG CONTACT. FEMALE. AWG24-28
FB101	1-543-298-11	s	BEAD. FERRITE
FB102	1-543-298-11	s	BEAD. FERRITE
J1	1-507-676-00	s	JACK. PHONE "INCOM"
J2	1-507-676-00	s	JACK. PHONE "PGM"
J3	1-507-251-XX	s	JACK "EARPHONE"
RV1	1-237-981-11	s	CARBON 20K "PGM LEVEL"
RV2	1-237-981-11	s	CARBON 20K "INCOM LEVEL"
S1	1-570-928-11	s	SWITCH. TOGGLE "POWER"
S2	1-571-368-11	s	SWTCH. TOGGLE "TALK"
S3	1-553-739-21	s	KEY BOARD "CALL"
S4	1-553-739-21	s	KEY BOARD "RET 2"
S5	1-571-368-11	s	SWTCH. TOGGLE "MIC IN INT/EXT"
VDR1	1-806-504-11	s	VARISTOR ERZ-C05DK820
VDR2	1-806-504-11	s	VARISTOR ERZ-C05DK820

PACKING MATERIALS & SUPPLIED ACCESSORIES

Ref. No. or Q'ty	Part No.	SP	Description
1	A-7513-880-A	o	MOUNTED CIRCUIT BOARD. EX-190
1	3-676-269-00	s	CAP (50P SOCKET SIDE). DUST
1	3-698-917-01	o	BELT. SHOULDER
			Serial No. 10001 ~ 10315 (UC)
			30001 ~ 30290 (J)
			40001 ~ 40790 (EK)
1	A-6772-374-A	s	BELT ASSY. SHOULDER
			Serial No. 10316 ~ (UC)
			30291 ~ (J)
			40791 ~ (EK)
1	3-701-622-00	o	BAG. POLYETHYLENE
1	3-701-635-00	o	BAG. POLYETHYLENE
2	3-717-823-01	s	COVER. BNC
1	3-734-214-01	s	CLAMP. CABLE

Please see pages D-9 and D-10 for the part numbers of capacitors and resistors that are not listed in the parts list.

CA-55P (EK)
2-128-252-07
396

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